

ELECTRIFIED!

TRANSPORT BEYOND OIL AND GAS

Fact: Russia is economically dependent on Oil and Gas

Fact: Russia has sacrificed modernisation and industrialisation for a growing GDP that is generated with its natural resources; oil, gas, minerals or metals.

Fact: Russia, has attempted to re industrialise many times in the past with instant unsustainable solutions.

Fact: As the developed world moves towards energy security Russia will lose the power that it wields with its energy reserves.

Fact: The low carbon economy is not a fad and it is set to change the world like the information technology wave did.

Minimisation of energy in Russia depends on the successful generation of an alternative economy that will liberate Russia from its economic dependency on oil and gas.

ELECTRIFIED! is a three phase fossil-fuel free transport programme that will

... jump start industry and innovation in Russia

... create an economy based on 'more plastic and less cement'
<<cars for Comrades By Lewis Siegelbaum, phrase describing the economy in the Brezhnev Era>>

... provide three decades of economic growth

... generate knowledge capital in the country

... replace dwindling energy power with a competitive market power

... expand on energy savings within the country

Author: Naina Gupta as a research student at Strelka institute of Media, Architecture and Design. The project is in collaboration with OMA(Netherlands)

Why Save?

...because no one is immune.



Diagram 01

The record heat wave and peat fires in the summer of 2010 in Russia was a double energy disaster; one was caused by climate change and the other was climate change induced, uncontrolled burning due to indiscriminate mining of peat for energy

33% of the disasters of the last 100 years have occurred in the last ten years.

Wildfire and smog: a wakeup call for Russia
For many Russia's climate-related problems are linked to its fossil fuel and heavy industry, but burning smog and peat fires in the north are also linked to climate change. It is the combination of these two factors that is causing the most serious problems. Other factors contributing to the problem are the growing number of forest fires.

Above: www.guardian.co.uk, yevgenia Albats, 11 August 2010

...because we have one atmosphere without the borders that we create for land mass

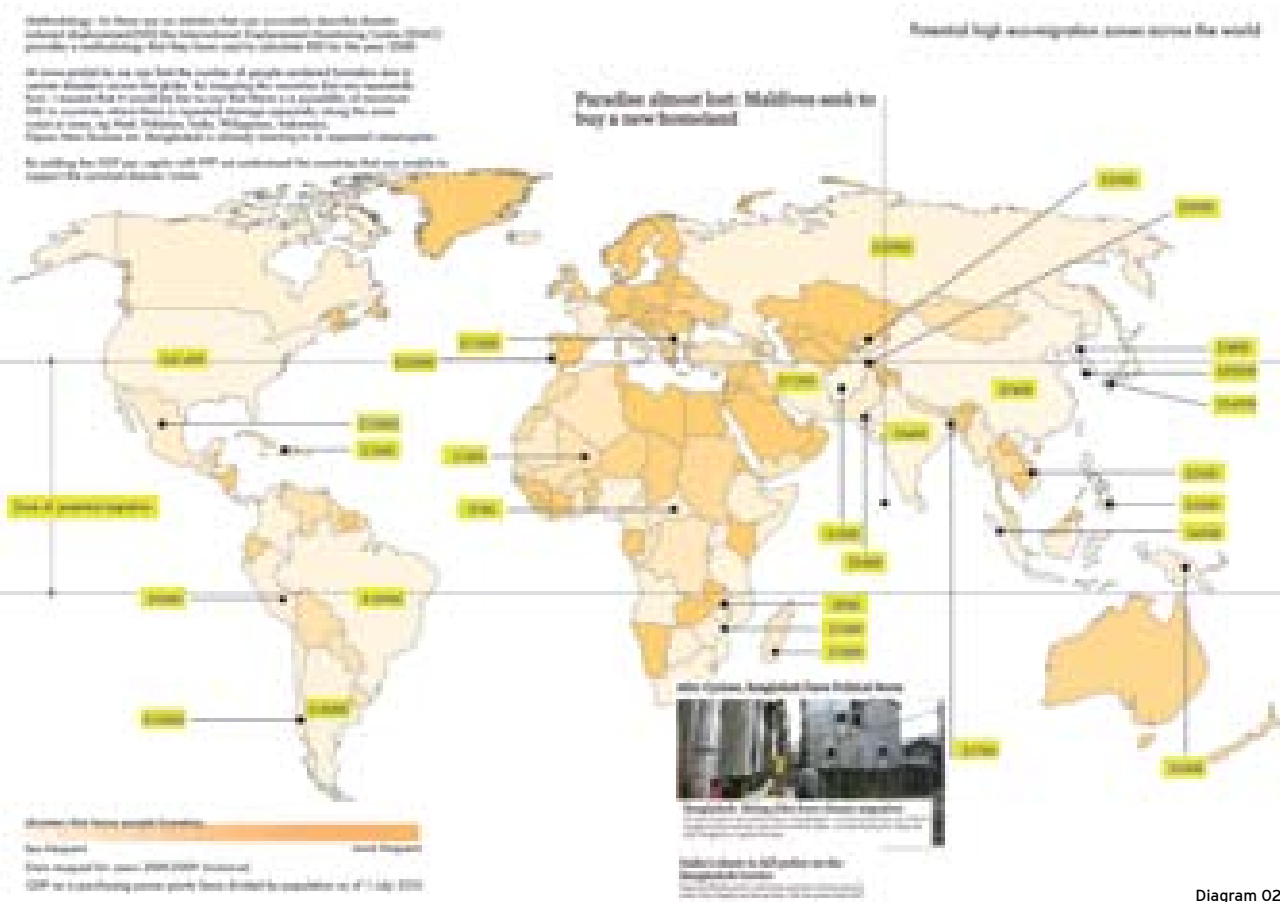


Diagram 02

The eco-migration band is the zone within which the frequency of environmental disasters creates homelessness regularly.

Studying the GDP of the countries within the band shows that most of these countries are defined as developing or even poor countries.

Developing economies may find the stipulated need to reduce emissions a financial burden, but the financial burdens

of repeated devastation combined with the social cost of migration, will be far more debilitating.

The low carbon economy is not one that should be phased across the world but rather should be jump-started with equal intensities across economies to ensure that we avoid further climate change and more importantly, to ensure that developing economies do not get locked into soon-to-be obsolete technology.

Minimisation Potential

Is a function that is created to isolate and identify an object in an individual's lifestyle that consumes energy and with intervention could form a marked difference to the country's energy profile. It is defined by three criteria:

- 1. The energy DNA of a country describes the energy consumption in the country's primary sectors, Industry, Transport and Residential and identifies the fossil fuel usage in each sector
- 2. Scalability Factor where key components within the road segment and non heating residential segment are isolated and the effort that is required to save a meagre 1000KToe is measured.
- 3. Market saturation describes the current status of the key components in the market of the country that is being evaluated.

1. Energy DNA

The energy consumed by a country is described in three primary sectors, Industry, Transport and Residential. In Russia all three sectors consume approximately 25% of the Total Final Energy consumption of the country as detailed by the International Energy Agency <<refer to Russian energy Losses; Russian Energy Balance in this book>>

Each sector has different proportions of fossil fuel (coal, oil and natural gas) , renewables (solar, hydro) and nuclear.

The Industry sector and the heating segment within the Residential sector is not directly influenced by the individual and is determined by the government. State Industry in Russia is currently focused on the production of energy and cement.

The road segment within the transport sector is primarily composed of oil products as an energy source while the residential (non heating segment) is composed of natural gas as the largest component

The residential sector consumes more energy than does the road segment

2. Scalability Factor

An individual in Russia consumes energy in heating, the use of electrical appliances, lighting and miscellaneous smaller uses of electricity such as the telephone, internet and the private car. Though the miscellaneous activities consume as much electricity as lighting does it would be difficult to monitor it as the number of equipments and the scale of electricity consumption per piece is fairly small.

Heating is a centralised system in Russia and therefore the individual has no control over it.

We are looking at lighting, electrical appliances and the private car use to evaluate how much intervention would be required to create a nationwide effect in the energy sector.

3. Market Saturation

The table below shows a high market saturation (above 90%) of the washing machine, television, and refrigerator in the Russian household. It will not be wrong to assume that most households own one washing machine and one refrigerator. The average lifespan of the two is 8 years, and even if the market continues to grow with new products, it would be safe to assume that newer technologies would be more energy efficient than any product made before 2000.

The computer and the car market are just taking off in Russia.

On the right is a graph that describes the growth in the automobile market from 2003 and the growth the global automobile industry forecasts for Russia.

	1993	1995	1999	1999	2000	2010	2020*
Televisions	26%	74%	92%			94%	
Refrigerators	11%	88%	99%			94%* (2007)	
Cars: Number of cars in the country	76,100	2,662,000	5,794,000		17,260,000	34,268,000	87,462,000 (PWC 2007)
Cars:						28.2%* (2007)	
Computers						3.8% (2007)	
Washing Machine						11.8% (2007)	

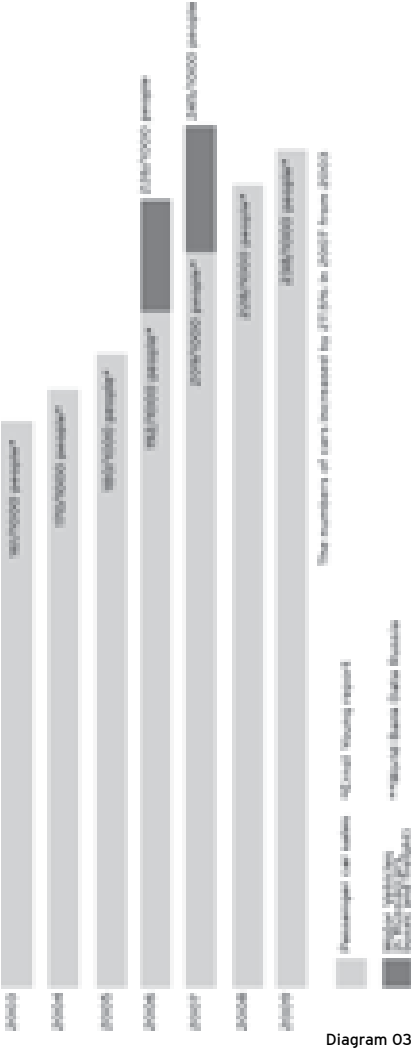
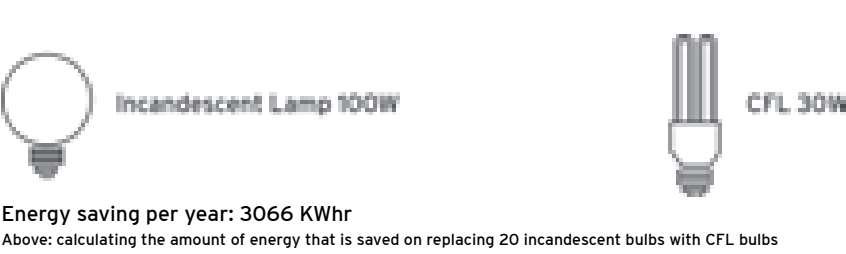


Diagram 04

Reduction of 1000 KToe of energy with lighting: Assuming the the CFL is currently the most energy efficient light bulb that is affordable in a home today and since it can be installed in a home without changing the light fixtures, we find that to save 1000 Ktoe of energy per year we would have to change 20 light-bulbs in **3,794,000** homes.



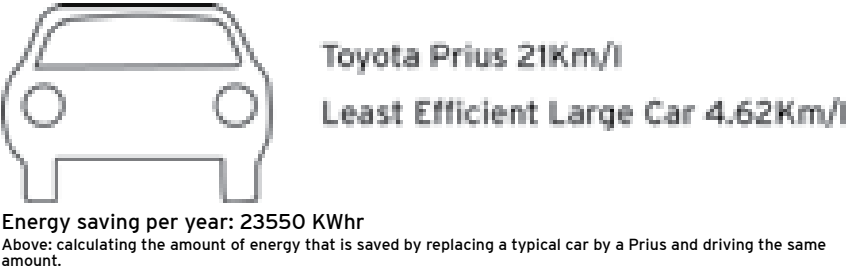
Reduction of 1000 KToe of energy with appliances: Appliances in the home like dishwashers, washing machines, ovens, refrigerators, portable heating consume electricity. By replacing these appliances by 'energy efficiency certified items we realised that to save 1000 Ktoe we would have to replace the large appliances in **38,000,000** homes.

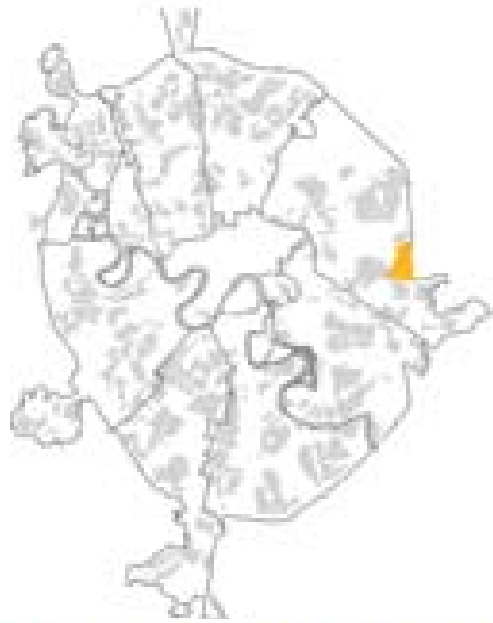


Reduction of 1000 KToe of energy with private cars: Russia has a motorisation rate of 238 cars per 1000 people and Moscow, 300 per 1000 people. This essentially means there is approximately one car per family in a family of three. Assuming, we do not reduce the amount the car is used but we exchange the car to one that is considered fairly fuel efficient (the same size and status) we find that we can minimise 1000 KToe of

Energy by replacing **49,400** cars.

It would require considerably less effort to lessen lower consumption by the same amount in road transport then in residential

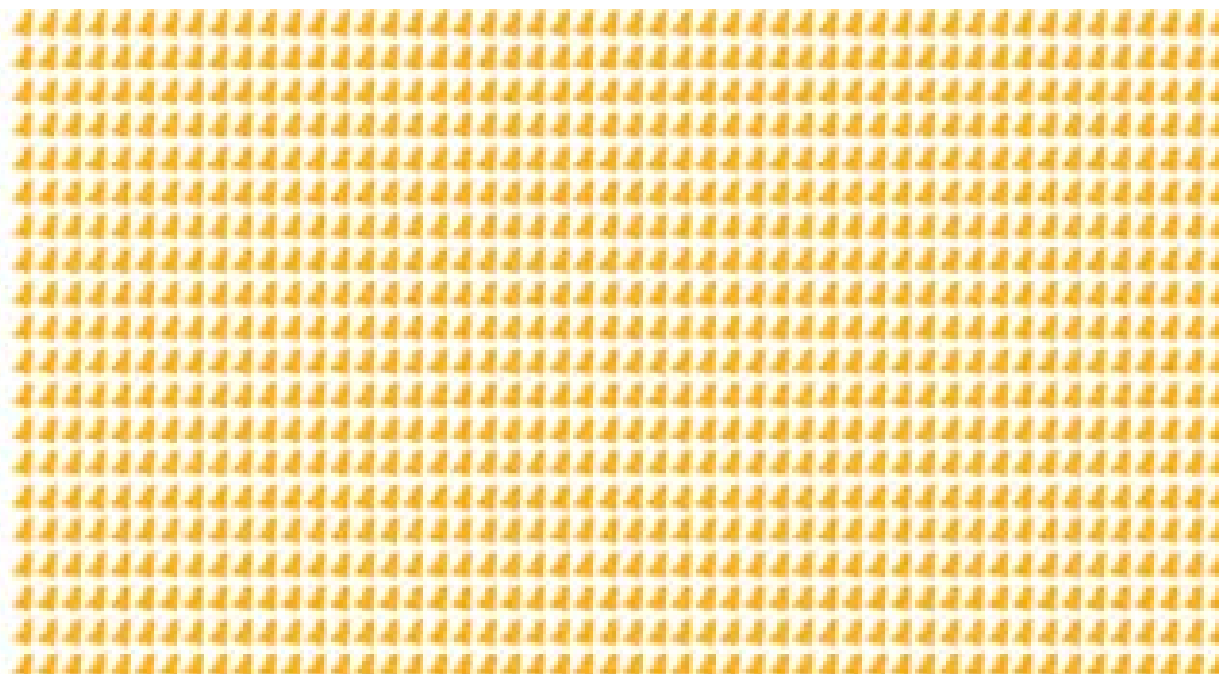




Veshnyaki is used as a sample to understand the spatial scale of intervention. It has 7 microrayons, 38000 apartments, 128,000 inhabitants.
Diagram: Merve Yucel



Scale of intervention to save 1000 Kt/yr by changing lighting



Scale of intervention to save 3000 Kt/yr by changing appliances. The official statistics says that there are 51.8 million households in Russia. This amount is equal to 74% of that



Scale of intervention to save 1000 Kt/yr by changing private cars

The current statistics on energy consumption patterns in Russia indicate that an individual consumes more energy in the residential sector than on the road. But the private car consumes more energy than any item in the residential segment and the car has not saturated the Russian market (2011).

The road segment of the Transport sector will grow with a growth in private vehicle ownership and with the inevitable rise in freight as the economy develops.

Nationwide intervention within the road transport segment would be precognitive, easier and more effective

“The automobile industry more than any other, becomes exemplary and indicative: its presence or absence in a national economy tells us the level and the power of the economy.”

Above:Fast cars, clean bodies : decolonization and the reordering of French culture: Kristin Ross

“When, on the morning of 6 July 1929, Nikolai Osinskii left Red Square at the head of the small caravan of five cars, it was not take an ordinary automobile trip. Then again, Osiniskii was hardly an ordinary automobiliat. An aristocrat by social origin, an economist by training, and a Bolshevik since 1907, he had served variously in the Soviet government as assistant Commisar of Agriculture, direc-tor of the Central Statistical Administra-tion and a member of the State Planning commission (Gosplan), before becoming assistant Commisar of the Supreme council of the National economy in 1929. Two years earlier, he had made an unusually strong case for the Automobi-lisation of the USSR in a length Pravda arc-ticle, “The American Automobile or the Russian Cart”. The article, reissued as a phamphlet, sparked the formation of Avtodor...”



“Soviet Car Rallies of the 1920s and 1930s and the Road to Socialism”

Lewis Siegelbaum: Cars for Comrades



AMO (1916) - ZIS (Zavod im Stalina 1931) - ZIL (Zavod im Likacheva 1956 by Krushev) - AMO ZIL (2010). “The Enterprise’s geographical proximity to the corridors of power in the Kremlin and Red Square parade ground and the use of its limousines in state functions of the highest order suggest a close symbiotic client-patron connection to the system’s center of political power”

RUSSIAN PRESIDENT ADDS ENDURINGLY SINISTER SOVIET-ERA ZIL LIMO TO WISH LIST
Dmitry Medvedev’s nostalgia for superpower trappings extends to trading in his Mer-cedes and bringing back the ZIL

Above: Luke Harding: Moscow; guardian.co.uk; Wednes-day 19th May 2010

Building the “Soviet Detroit”: The Construction of the Nizhny-Novgorod Automobile Factory, 1927-1932

Krushchev chooses the Chaika, a deli-brate symbol to distance himself from Stalin?

Third time lucky ?

In 1927, 1965 and in the 2000s the Soviet Union and now Russia attempted to introduce mass automobilisation in the country. For an industry that began in 1916, a motorisation rate of 238 cars per 1000 today people is extremely low.

The story begins in 1965 when the Russian automaker Avtovaz was es-tablished under Leonid Brezhnev. The Soviet Union decided to quadruple its automobile production in 1965 with the eighth five year plan, 6 years after oil reserves were discovered in the Tyumen region. Widespread automobilisation in the Soviet Union and subsequently in the Russian Federation can be di-vided into four main directions under four governments,Brezhnev(1965), Gorbachev(1985), Yeltsin(1990) and Putin(2000).

In the 60s the government opted to meet the basic consumer demands of its peo-ple. Avtovaz was created in the late 60s in collaboration with Fiat(Italy) to create the quintessential Soviet automobile. In the 80s Avtovaz was responsible for the largest Soviet manufactured export; the Lada. Half of Avtovaz’s production was exported and the Soviet Union saw a very slow growth in motorisation rate.

the deserving. Even when Brezhnev initi-ated the need for mass national automo-bilisation, manufacturing could not keep up with the demand and the automobile remained a far-off dream that was to be ‘queued’ for.

The queue in Soviet times was a control and distribution mechanism. Consumer goods were distributed rather than sold even though they were paid for.

The aim of the Soviet Union was to incul-cate a culture based on community and a more refined, intelligent, pragmatic ap-proach to material goods as tools rather than status. The government made equal promises to all its citizens and material comforts were the reward. Brezhnev, set out to make good on this promise when the country looked like it was sound and oil reserves had been discovered.

Under President Vladimir Putin, whose administration benefitted from high oil prices and a growing GDP, Russia attract-ed international automobile manufactur-ers to meet its domestic demand for cars. After an extensive documentation of International and Russian media, it would not be an exaggeration to say that Rus-sia’s auto industry has far greater ambi-

“From the 1960s a shift had been taking place in work. It was more toward the production of consumer items such as automobiles, electronic devices, pharmaceuticals, civilian aircraft -- a production that was more knowledge intensive, more plastic and less cement.”

http://www.fsmitha.com/index.html

Lada exports and domestic production of AvtoVAZ slowed down to an end with the collapse of the Soviet Union and it was only in 1998 when the Russian Ruble was devalued, that manufacturing in Russia became a lucrative option.

Socially, the automobile went through its own cycle of acceptance in the Soviet era. Soviet ideology was faced with con-tradictions posed by the progress that the car would enable in infrastructure and urbanisation, and the power of the car to differentiate and atomise. During the Soviet era the automobile was yet another benefit that were showered on

tions than addressing domestic demands.

We don’t want to undermine your busi-ness in Russia,” Putin said, addressing foreign carmakers while driving across Siberia in a Lada, produced by OAO Av-toVAZ, the country’s largest Automaker. “Don’t just come here. We want you to gradually transfer your technology, increase production and help boost the technical expertise of our specialists.

Above: Russia to raise car-import Tax to boost domes-tic production: Business week (August 2010)

At the moment the only projection for the automobile industry in Russia is domestic saturation of the market, to 60 million cars from 30 million in 2010 by increasing domestic production to 3.5 million units by 2025 (PWC Report). The Russian government has budgeted incentives of 1.2 trillion rubles upto 2020 to benefit the automobile industry while simultaneously increasing taxes on im-ports of used and new cars.

The car is one of those promised ‘Soviet luxuries’ and 20 years after the col-lapse unrealised promises are still remembered. It defines a spectrum of other associations; as an object of desire,fear,jealousy, annoyance, privacy, additional income, distraction, theft and nationality. This strong set of emotions associated with the car has caused a very simple item of convenience to be-come, even today, an object that defines the right of the citizen. This is evidenced as is obvious by the demonstrations that break out across the country every time there is even a hint of that right being taken away, altered or inconvenienced. Of course, we should never forget that the car was also one of the first few spaces that an individual owned and determined.



This is why Russia is the perfect candi-date to make a change to a low carbon transport economy. The country wants to revive the automotive industry; the individual views the car as an object symbolic of his right as citizens and national pride. The car in it’s current form uses energy from oil products, but it has not yet saturated the Russian market. Today’s technology is perfect for alterna-tives.

Saturday 10 May 2013

Trillions of roubles for Russia's car industry

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0.04PM GMT (4 May 2013)

The Russian government estimates total investments in the development of the car industry at 1.2 trillion roubles-1.8 trillion roubles (€270b-€400b) up to 2036, a source at the industry and trade ministry announced.

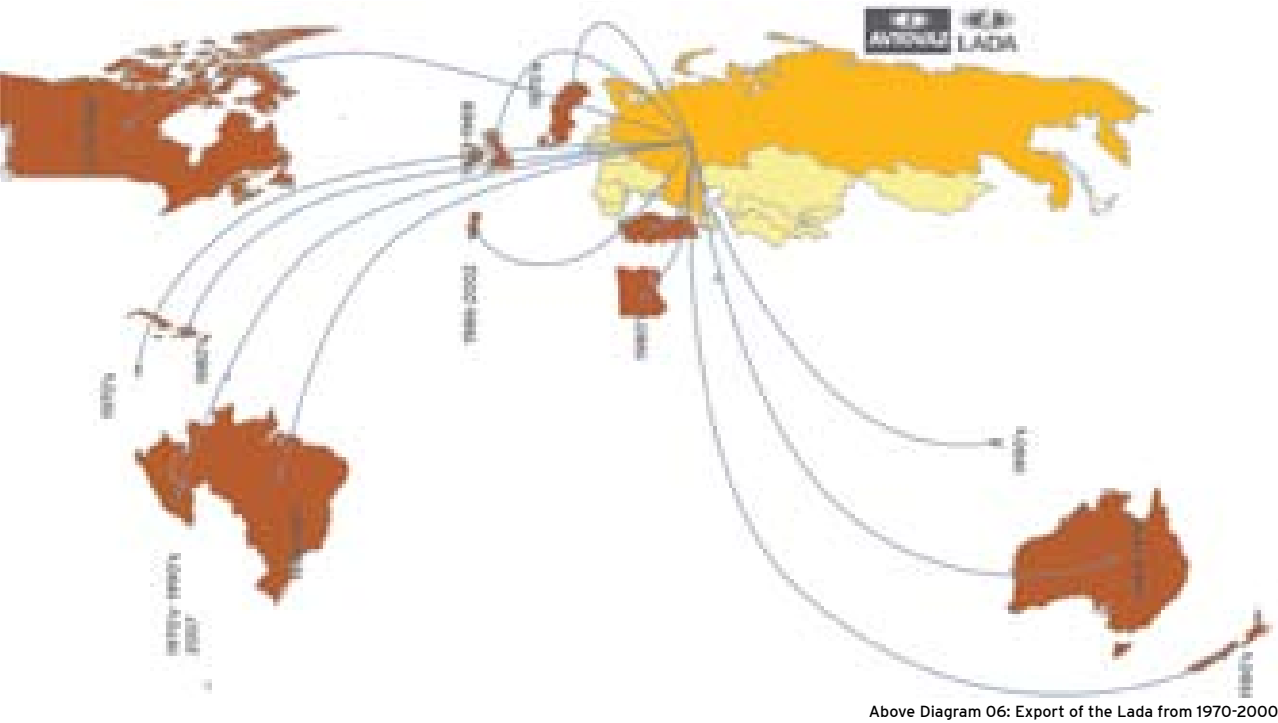
Russian automobile producers and the Russian government are expected to invest about €300b roubles and the remainder of the investment is expected to come from foreign producers.

Of the total Russian contribution, €300b roubles are expected to be spent on the upgrade of production facilities, 100bn on research, and 100bn on the production of components, the source said.



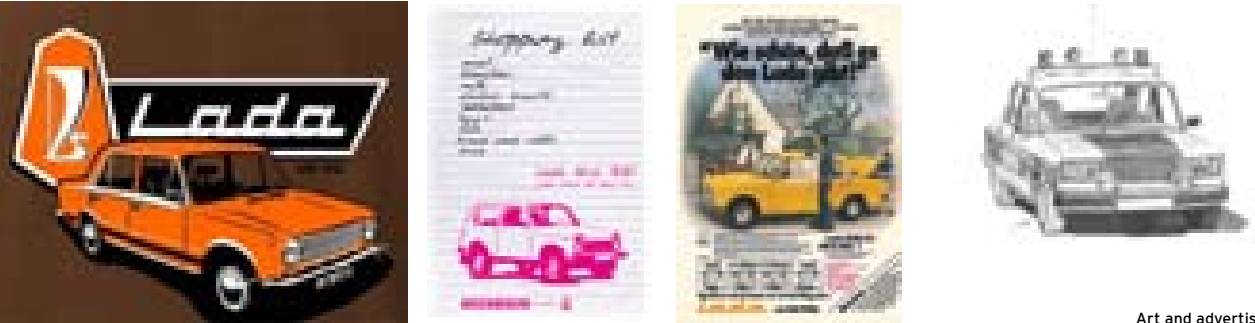
The national football club is named after the Lada. The Lada, locally known as the Zhiguli Sputnik, was the largest manufactured export of the Soviet Union. Today, the Lada describes two moments of national pride in Russia, as football club and as an internationally recognised Soviet product.

The Lada world: Beyond the USSR



Above Diagram 06: Export of the Lada from 1970-2000

Lada Poster art



Art and advertising

The Electric car 1839-1912: Strike 1:

The electric car could not compete with the mass production of the gasoline vehicle, the ease of the electric ignition and the large distances that were possible. The Texan oil companies were important for GDP and they formed a strong lobby forcing innovation in the direction of the ICE. <<see renewable energy development timeline; Russia's Energy Future>>

1839: First electric car: Non rechargeable battery



1897: Fleet of electric taxi in New York



1899: Thomas Edison: First long lasting battery for commercial production



1908: Henry Ford: Ford T: Mass production of automobiles



1912: Charles Kettering invented the electric ignition.



The Electric car 1966-1900: Strike 2:

The Electric car became a priority after the 1973 Oil Embargo for US Energy security. When Japan introduced their fuel efficient vehicles and lean production technique, innovation in the direction of the electric car was suspended.

1972: First Hybrid: Victor Wouk; Buick Skylark



1974: Vanguard-Sebring's citycar; The company dissolves a few years later



1975: The US Postal buys 350 electric jeeps.



1988: GM concept car EV1. Produced from 1997 for lease only



The Electric car 2006- : Third Time Lucky ?

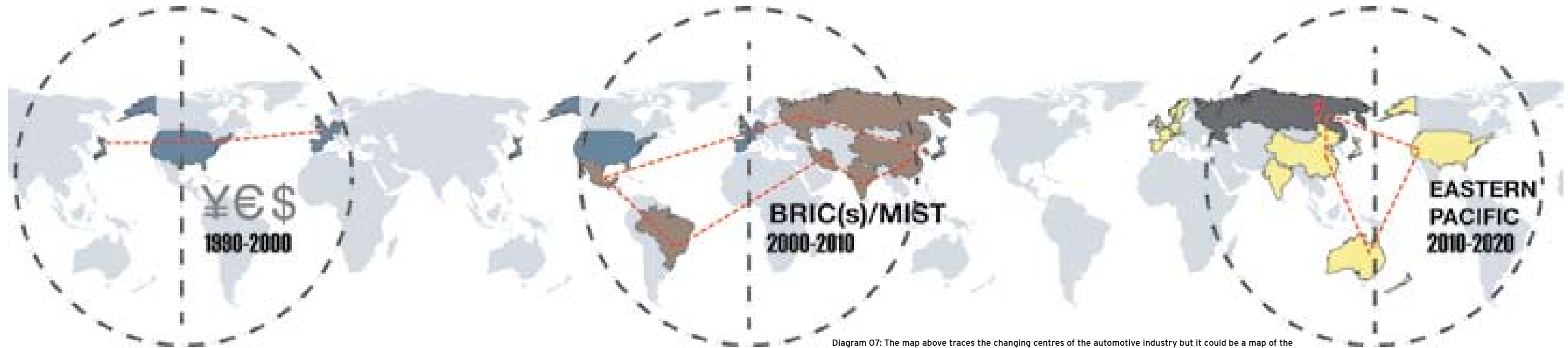


Diagram 07: The map above traces the changing centres of the automotive industry but it could be a map of the changing economic centres, or port networks.

The Sliding Axis

The economy is sliding towards the East and South. This is particularly true for manufacturing, as the developing worlds of India and China are industrialising rapidly to become global manufacturing centres.

The United States dominated the automotive industry till the 1950s. European car manufacturing gained a market share in the 50s because of technological innovations and stylistic additions to the cars. European and American manufacturing were in stiff competition from the 1950s to the 1970s, after which Japan entered the market with fuel efficient technologies introduced in Japanese models and a lean production technique; which coincidentally creates energy consumption in freight.

The 2000s have seen new players emerge in China, South Korea and India. <<Global Automobile Industry: Changing with the times: Chithra Gopal>>

In 2009, the automobile industry suffered heavy losses partly because of over capacity of the industry. The developed world is saturated with cars and the developing world is a slow market. The economic crisis and the high oil prices also contributed to the collapse of the industry. Together they created a situation where consumers opted for smaller, more energy efficient cars rather than the large versions that the automotive industry aggressively promoted.

Post 2008 recession, the global automobile industry is shifting to fuel efficient technology which means either technological improvements in the existing internal combustion engines and lighter cars or alternative fuels, such as electric, hybrid, biofuels or hydrogen cars. Transport consumes a huge percentage of the energy resources of a country and emits a large amount of carbondioxide. The shift is primarily due to energy security and mandated carbondioxide emissions reductions for developed countries by 2050.

Every technological change heralds a change in the landscape of the automotive industry.

Japan, South Korea, Australia, New Zealand, Western United States, Northern Europe, Ireland, India and China are currently introducing or are about to introduce variants of fossil fuel free transport.

Cleantech and Biotech are the next wave of industrialisation <<Nicholas Stern, Policy Paper, November 2010: China's growth, China's cities and the new low carbon economy industrialisation>>.

The low carbon economy, is an answer to the concerns about energy security, carbon pricing, economic crisis, market saturation and the need to stimulate employment, innovation and services.

Historically, the developing world has been very quick to adapt to new waves of industrialisation. It would be naive to assume that the 6th wave could be reached by trudging through the previous five. The automobile industry is very important for the national economy of any country because it is one of the largest manufactured exports that requires technical know how, allows for the urban development of the country and creates a network of smaller industries and, consequently employment.



Diagram 08: Global Financial centres in the Pacific



Emerging economies in the Pacific



Diagram 09: Ports in the Pacific



Diagram 10: EV production in the Pacific

Russia seems oblivious to its Pacific existence. The Pacific coast is the hub of innovation in the new low carbon transport economy

Automobile production in the world currently

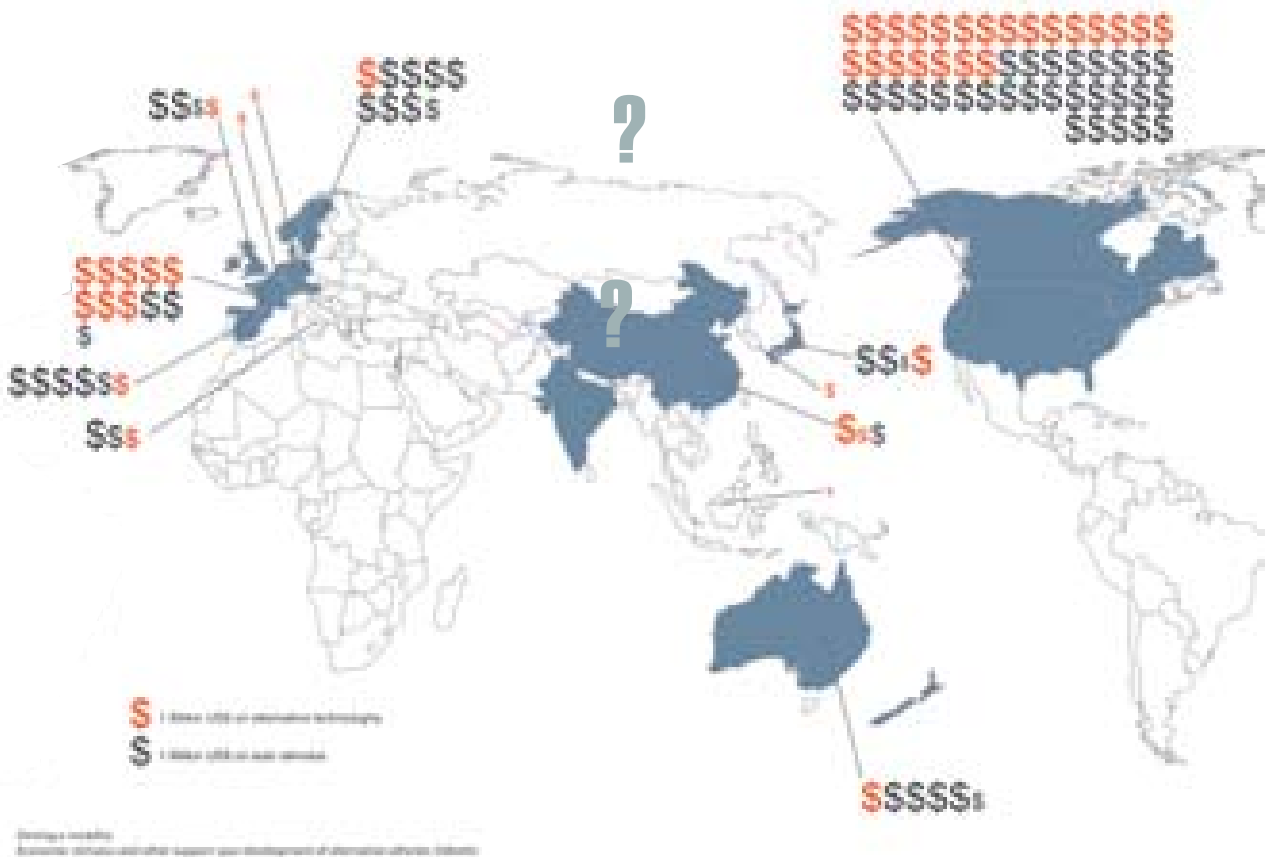


EV commitments: Production and use - 2050



Top Diagram 11: Countries that produce more than one million automobiles in a year currently and Above Diagram 12: Countries that are committing to global production of electric/ PHEv vehicles or committing to change their existing fleet within the country by 2050. We see new centres of automobile production emerging.

Stimulus for the automotive industry



Above Diagram 13: The stimulus extended to the automotive industry for development of the existing industry and the fossil fuel free automobile industry.

In the 'Technology Roadmap: Electric and plug-in hybrid electric vehicles' published by the IEA the global timeline for electric and plug-in hybrid vehicle suggests that the experimental phase is from 2010-2015, the preparation phase is from 2015-2020 and the commercialisation phase is from 2020. It would seem natural to assume that the first to adapt in manufacturing and distribution would benefit maximum.

Short term global suspension of the duty and import tax is necessary for low carbon transport solutions to attain enough momentum for innovation.

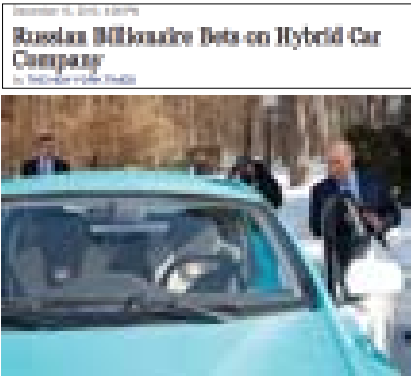
Low carbon industrialisation is the economic model where climate concerns meets development and progress.

Russia: hybrid ambitions 2012

Russia has started developing a hybrid car, called the Yo-mobile, due to be released on the Russian market in 2012. Although it is more fuel efficient than cars that runs on oil and diesel (the carbondioxide emission per mile driven for a conventional vehicle versus a hybrid is 452gm to 294gm) the low carbon transport economy cannot stop at hybrid cars because they use fossil fuel; in an electric car emissions are determined by the method that is used to generate the electricity.

Russia generates 68% of it's electricity by thermal processes (Natural gas being the primary fossil fuel, with some coal, minimal oil), the rest of the electricity is generated by hydroelectric and nuclear.

With natural gas, nuclear and renewables the amount of carbondioxide emitted is 256g/mile, 152g/mile and 150g/mile (<http://www.treehugger.com/>)As electric-ity generation moves towards cleaner solutions so will the electric car, but the hybrid vehicle is doomed to generate the same amount of emissions. The amount of emissions is directly equivalent to the amount of fossil fuel burned.



Above: Vladimir Putin test driving the Yo-mobil

“He said hybrids are like mermaids. When you want a fish you get woman and when you need a woman you get a fish.”

Shai Agassi quoting CEO of Renault-Nissan Carlos Ghosn in his TED talk: 'Shai Agassi's bold plan for electric cars

What can I do ?

The car in Russia is one the few consumer items that excites Russians enough to voice their concerns. The primary reason may be, that the automotive industry is very important to the country and the government has been trying to boost the industry for 90 years.

The importance of the industry is also apparent in Putin's aggressive testing of the Lada and the Yo-mobile, both of which are Russian made cars.

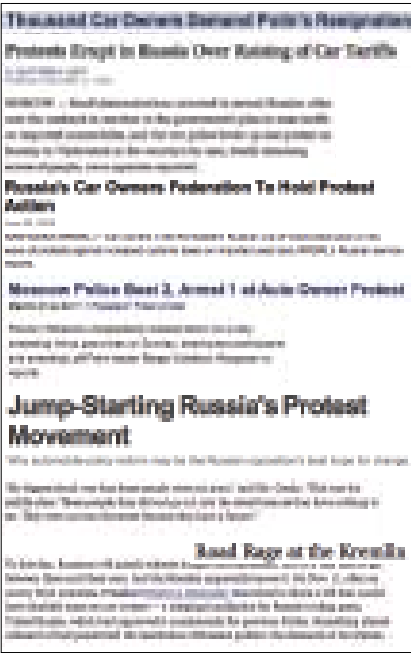
In 1927, Nikolai Osinskii instigated the need for 'Za Rulem' (behind the wheel), a magazine to increase the appreciation of cars <<cars for comrades: Lewis Siegelbaum>>; Putin will create the environment for Formula 1 racing in Sochi as a gesture to woo Renault and create an environment to promote the car as recreation.

By ensuring that the country's citizens are aware of the extent of change and all it's implications, Russia could be coerced into the fossil fuel free economy from within.



Above: Car demonstrations to voice their annoyance about the lawless use of the sirens by the elite.

Through their active involvement a citizen can initiate change.



ELECTRIFIED !

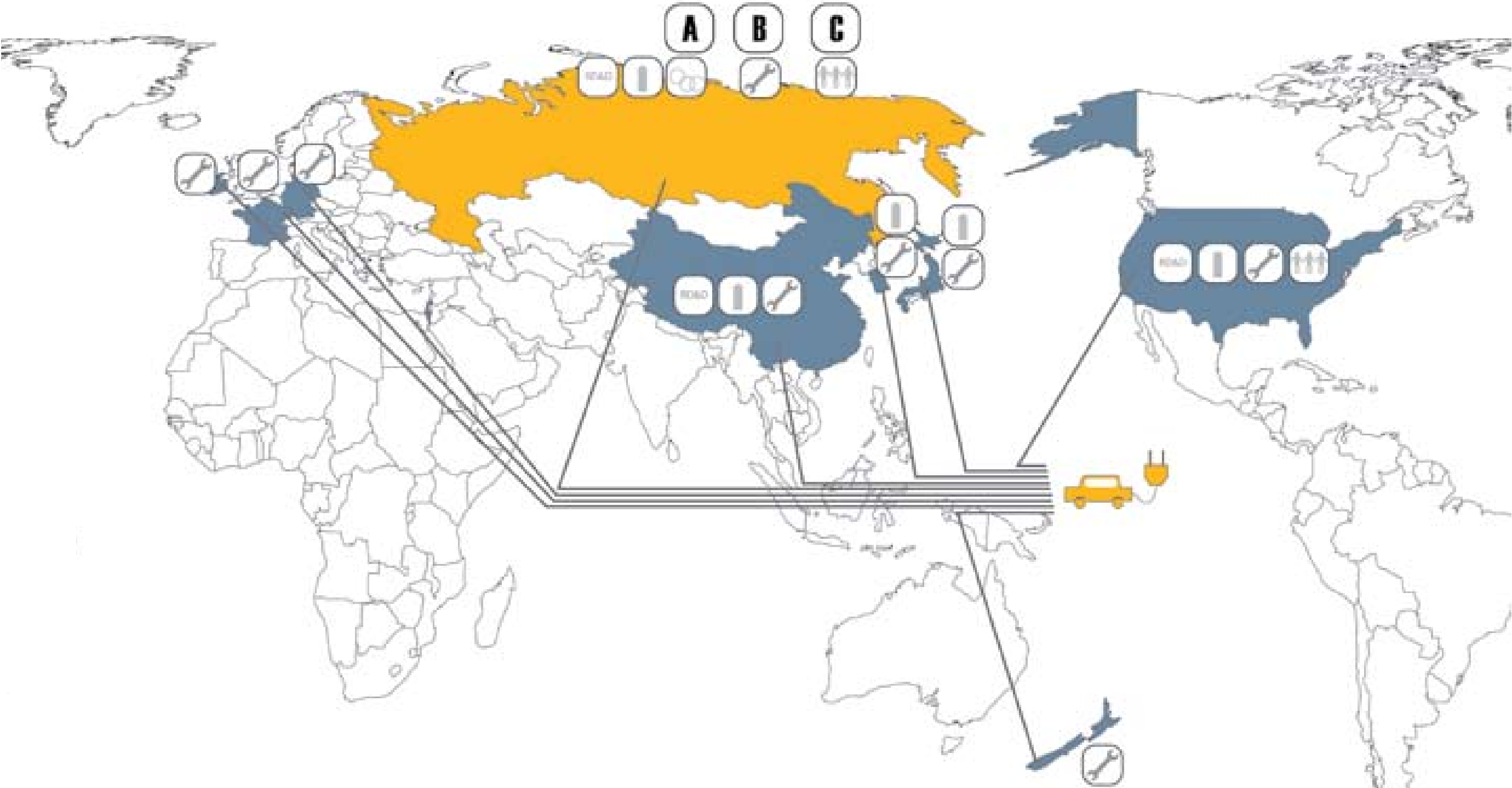
Phase A, Russia is working on its existing strengths: the availability of minerals and metals for the global supply chain, the availability of land and resources to create battery production facilities for China and Europe and a University with relevant departments that is close to the two largest battery manufacturers of the Electric Vehicle (EV) industry.

This is the phase where Russia gains know how, funds and creates an environment for phase B.

Phase B Russia has a dual strategy to introduce manufacturing in the country. In Western Russia manufacturers will retool existing car plants and in the East, Russia will participate in the Global manufacturing collective acquiring know how, skills and technology.

Phase C This phase entails the national adoption of the electric vehicles. It works on the principle of top down strategies and framework meeting bottom up individual enterprise through the medium of the private investment.

PHASING



ELECTRIFIED is a three step programme to create a low carbon transport economy in Russia to emancipate Russia from it's economic dependency on oil and gas.

RD&D

Research and Development

Battery Production

Battery Production

Supply Chain

Supply Chain

Auto Manufacturing

Auto Manufacturing

Mining

Mining

National Deployment

National Deployment

Phase A2011

Russia is the largest source of the world's Nickel supply and the second largest source of rare earth metals. These resources are especially important for battery technology, thus they are crucial to the electric car.

Nickel is already being mined in Russia and has made some people very rich, but rare earth metals are treated like a mining byproduct right now.

China was the world's largest supplier of rare earth metals until the country decided that they needed those metals for their own ambitions in the low carbon economy. China has reduced metal exports to a minimum.

Rare Earth metals are the 'New Oil' but rather than treat them as an exportable product Russia becomes part of the supply chain by using the metals as leverage to create national and international investment.

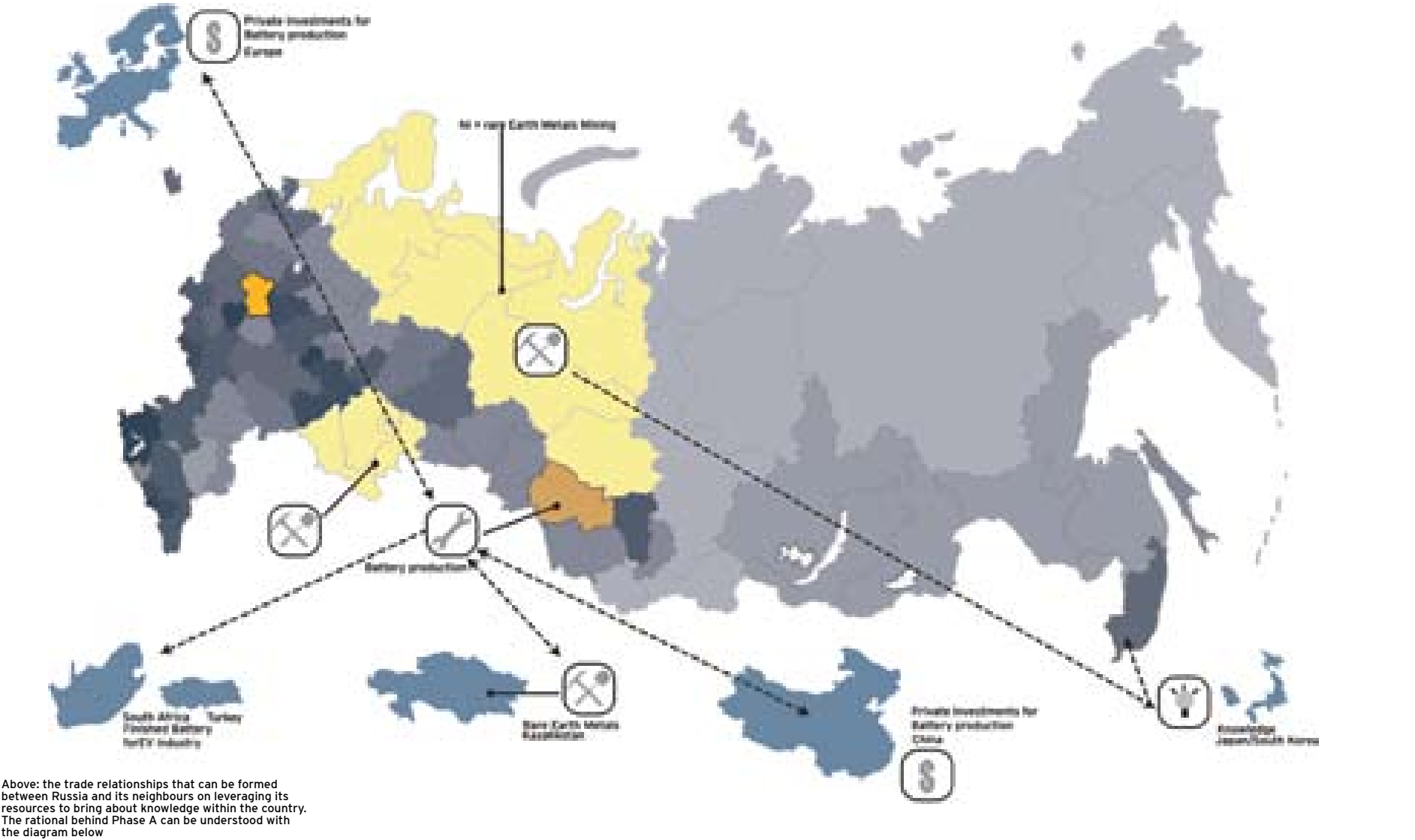
Rusnano and a Chinese investor, Thunder Sky are planning one EV battery production centre in the Novosibirsk region.

Novosibirsk is located between Kazakhstan and Western Siberia (both have large known resources of rare earth metals). it is perfect geographically for Battery manufacturing and supply.

In tandem with the battery manufacturing, Russky island, the venue of the APEC 2012 Summit in the Far East, and the site of the new Far Eastern University, will be developed as the centre for Battery technology research and development along with electric vehicle testing and development.

Russky island neighbours Japan and South Korea; two countries advanced in battery manufacturing and technology but they both do not have the necessary metal resources. Russia is the link between Kazakhstan and the East, bypassing China.

Some of the existing departments could begin research and development for EV technology.



Above: the trade relationships that can be formed between Russia and its neighbours on leveraging its resources to bring about knowledge within the country. The rationale behind Phase A can be understood with the diagram below

EXPORT RESOURCE

Scenario 1: Russia mines rare earth metals and Nickel and uses them as the 'New Oil'. The country benefits from GDP growth but there is no trickling down of knowledge and wealth, leaving the country as it is

LONG TERM ECONOMIC GROWTH

Scenario 2: Russia uses it's resources as leverage to create alliances, barter export for knowledge and Research and Development expertise, and private investment providing a long term industry in Novosibirsk region.

China Minerals:Strangely Only they supply of Rare-Earth Metals

Japan Recycle Minerals From Used Electronics

The Battle Over Rare Earth Metals

Russia may cash in on China's rare-earth metal exports

Transport alternatives (electric cars), Renewable technologies (wind turbines), ICT (iphone) and High end Scientific equipment (MRI, x ray) all use rare earth metals

Russia has the world's second largest known resource of rare earth metals and it is currently mined as a secondary material rather than the primary.

Russia, Kazakhstan team up to produce rare earth metals

Russian company to build EV batteries

Forming strategic alliances with kazakhstan, Russia can increase it's source and get transit economy to pass the resource to Japan and S. Korea, bypassing China

Thunder Sky (china) has invested in Novosibirsk, battery production unit to be built by RusNano.

Bartering a constant supply of rare earth metals for creation and knowledge investment into the R&D Far East University in Russky island.

Oligarchs Fight Over Nickel Company

Business Insider, 2011

World's nickel titan's sale forms the work of the state's nickel producer along a little of the world's nickel, has become increasingly profitable. Nickel is used in stainless steel, which is in demand in China, and is working out a new market as an important raw material for batteries used in electric cars.

The Great Battery Race

China's government has poured billions of dollars into research and development of battery technology.

China was supplying 92% of the world's requirement of rare earth metals but in 2011 it has committed to reducing the supply by 35%.

Due to border disputes with Japan, China reportedly stopped rare earth metals exports to Japan (Dec 2010)

Russia is the world's second largest known resource of rare earth metals and it is currently mined as a secondary material rather than the primary.

Russia, Kazakhstan team up to produce rare earth metals

Forming strategic alliances with kazakhstan, Russia can increase it's source and get transit economy to pass the resource to Japan and S. Korea, bypassing China

Bartering a constant supply of rare earth metals for creation and knowledge investment into the R&D Far East University in Russky island.

FOR EUROPE AND CHINA (2012), SOUTH AFRICA AND TURKEY (2013)

INTRODUCTION

SHORTAGE

OPPORTUNITY

ALLIANCES

KNOWLEDGE TRANSFER

Russian automotive production was centered in the Western part of Russia from 1916. Leningrad, Tolgiatti, Nizhny Novgorod and Moscow oblast are centres of car manufacturing and this is reflected in the densities of the cities in these regions. Vladivostok, on the other hand, became the centre of used car imports in the Far East from Japan, on the collapse of the Soviet Union. Krasnoyarsk is where the new produced cars in the West and the older, imported cars from the East are distributed.

There are 7 car manufacturers in Russia that make electric cars in other parts of the world.

Their production facility can be retooled with relative ease. In addition, the Western developed zones of Russia have 10 cities with a population of 1 million plus people. These cities are ideal for testing and deploying assembled and produced electric vehicle.

The Western manufacturing territory is transformed as an electric vehicle export hub for Europe and for internal demand.



Above: The companies in the West that can be immediately retooled to begin producing electric vehicles and the cities that they can correspondingly develop for testing and deployment of electric vehicles.



Above Diagram 14: The distribution of the Western and Eastern Automobile industry in Russia.

Avtovaz and Lada: Russia looking back to the future ?

1991:
Soviet Union (USSR) joins International Organization of Motor Vehicle Manufacturers (OICA)

1992:
Russia's Motor Vehicle Industry - a special report, Russian Auto Market Review & Forecast, International Experts

2001:
COMPANY NEWS: GM AND RUSSIAN CAR PRODUCER SET TO START VENTURE

2009:
Russia Wants Renault to Fix Lada

2010:
Renault Plans to Double Production at Moscow Auto Plant

Lada, the former Soviet Union's most popular car, is a symbol of the country's economic decline. The car is now a symbol of the country's economic decline. The car is now a symbol of the country's economic decline.

AvtoVAZ began production in 1960s in Togliatti with the first assembly line bought from Fiat (Italy). The Zhiguli, internationally known as the Lada, was one of the largest manufactured exports of the Soviet Union. From 1970-2002, the Lada was exported all over the world; to Asia, South America, Canada, Oceania and Europe.

In 1999, General Motors began a joint venture with AvtoVAZ, producing the Chevrolet for Russian markets (Chevrolet Niva, based on the Lada Niva).

Moreover Renault-Nissan, bought a share in the Lada ownership and is resurrecting the Lada phenomena for Russia.



Above: Renault's electric fleet
Below: Renault Lada looking to the British market

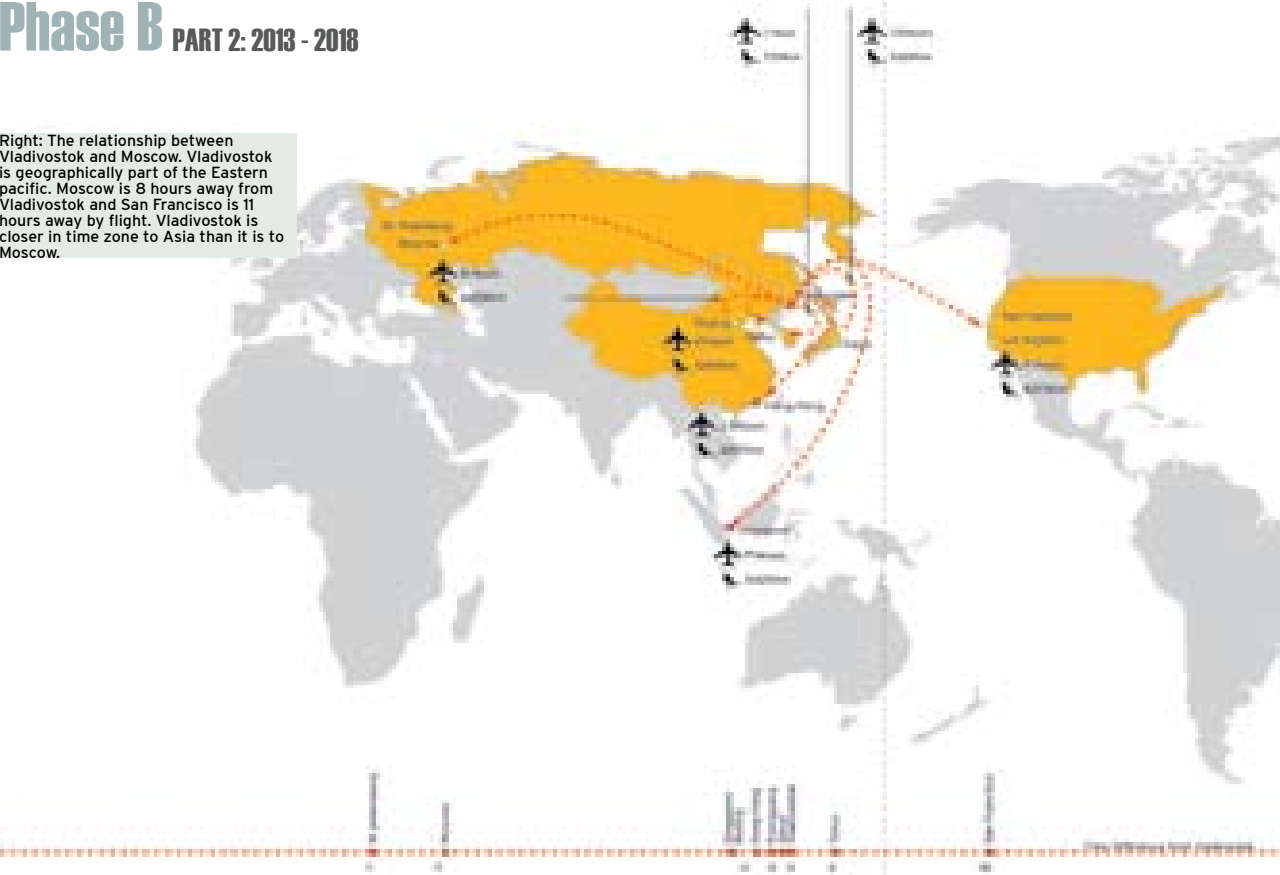


Russia's Lada may return to British market

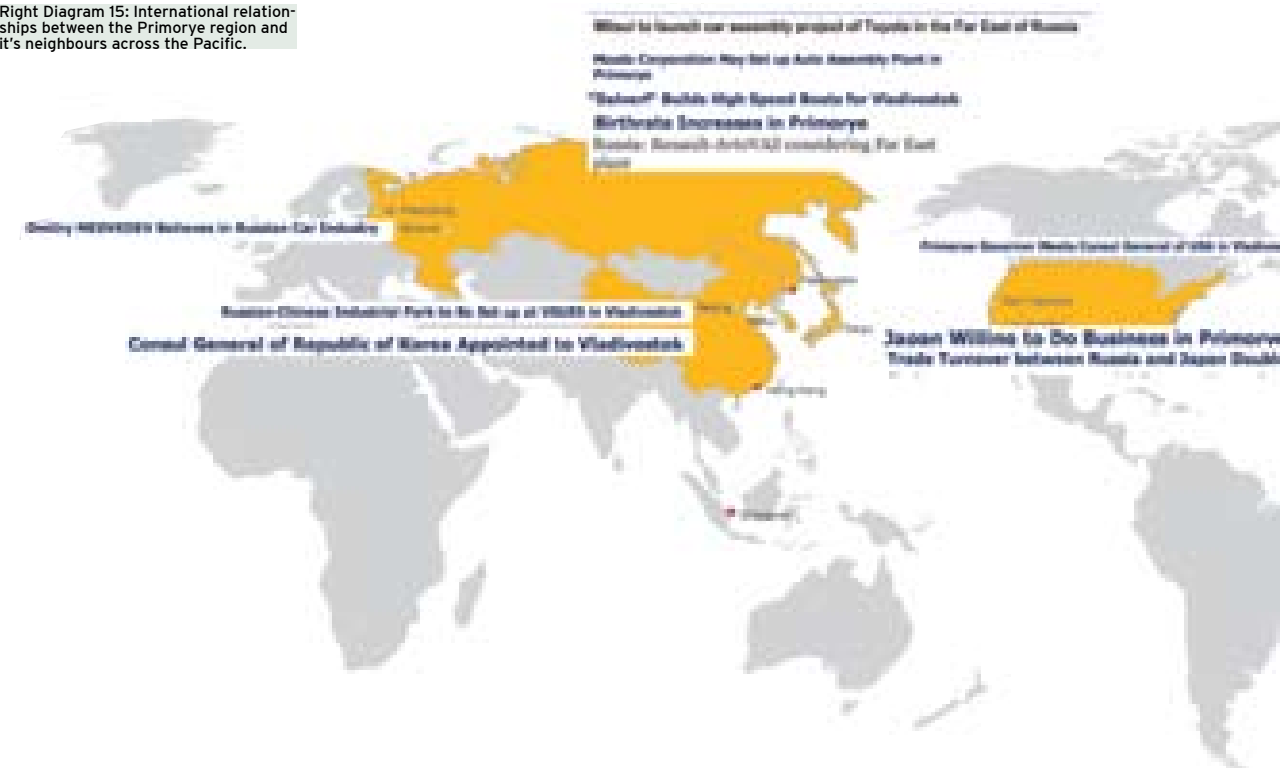
... BUT BRITAIN IS LOOKING TO CONVERT ITS ENTIRE FLEET TO ELECTRIC CARS BY 2030?

Phase B PART 2: 2013 - 2018

Right: The relationship between Vladivostok and Moscow. Vladivostok is geographically part of the Eastern Pacific. Moscow is 8 hours away from Vladivostok and San Francisco is 11 hours away by flight. Vladivostok is closer in time zone to Asia than it is to Moscow.



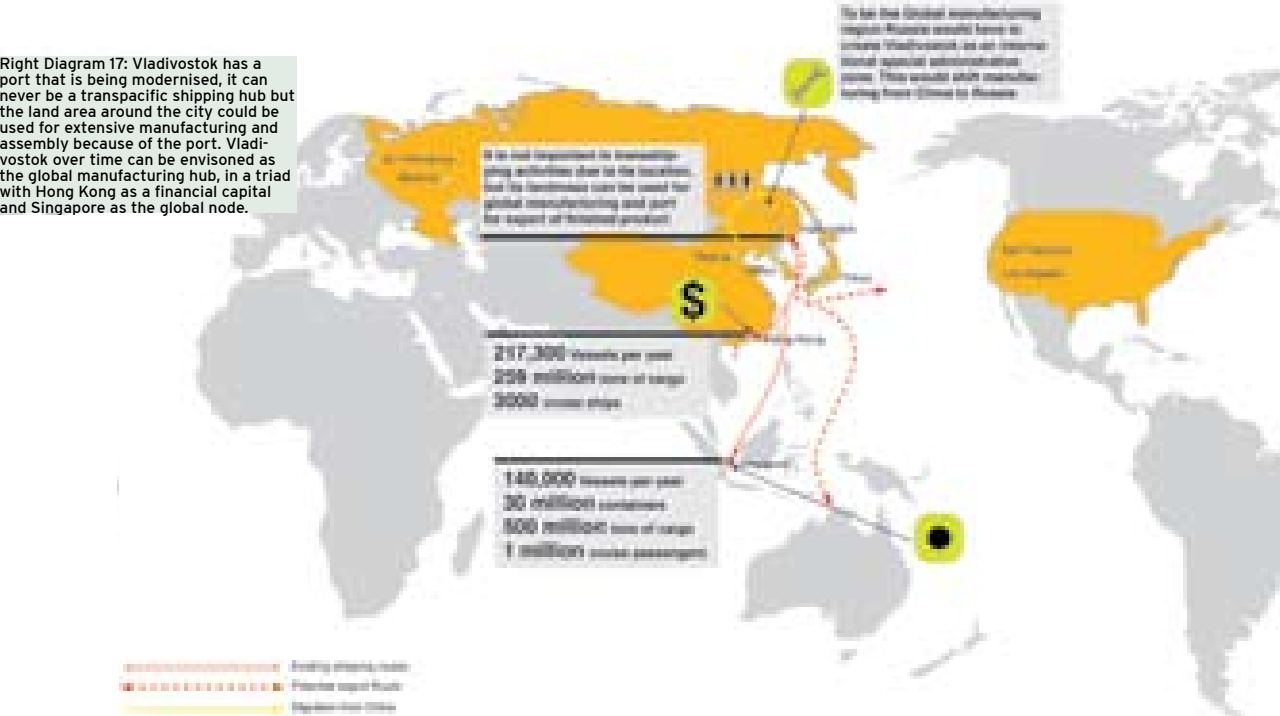
Right Diagram 15: International relationships between the Primorye region and its neighbours across the Pacific.



Right Diagram 16: The Primorye region in the centre of the global EV production zone



Right Diagram 17: Vladivostok has a port that is being modernised, it can never be a transpacific shipping hub but the land area around the city could be used for extensive manufacturing and assembly because of the port. Vladivostok over time can be envisioned as the global manufacturing hub, in a triad with Hong Kong as a financial capital and Singapore as the global node.



With the Economic world shifting towards the Pacific, The Pacific edge of Russia is poised to economic growth with a few clever articulations by the Government.

Vladivostok was the main naval base for the Soviet Pacific fleet. It was closed to foreigners and only opened after the collapse of the Soviet Union. Vladivostok sees migration from China, and tourism primarily from Japan and South Korea.

The Primorye region has a used car industry that was created by Japan. It employs around 100,000 people in Vladivostok and its surrounding regions, responsible for assembly, maintenance and selling cars. Vladivostok is also a shipping port and has a ship building industry.

In 2006, the government increased taxes on imported and used cars which fueled an economic recession in the region. To relieve the economy, the government moved a smal section of the car industry, which was located in West-ern Russia until 2009, to the Primorye region.

Sollers is one of the first automotive production units to be set up in Primorye. Mazda, Matsui, and AvtoVAZ are also showing an interest in the region.

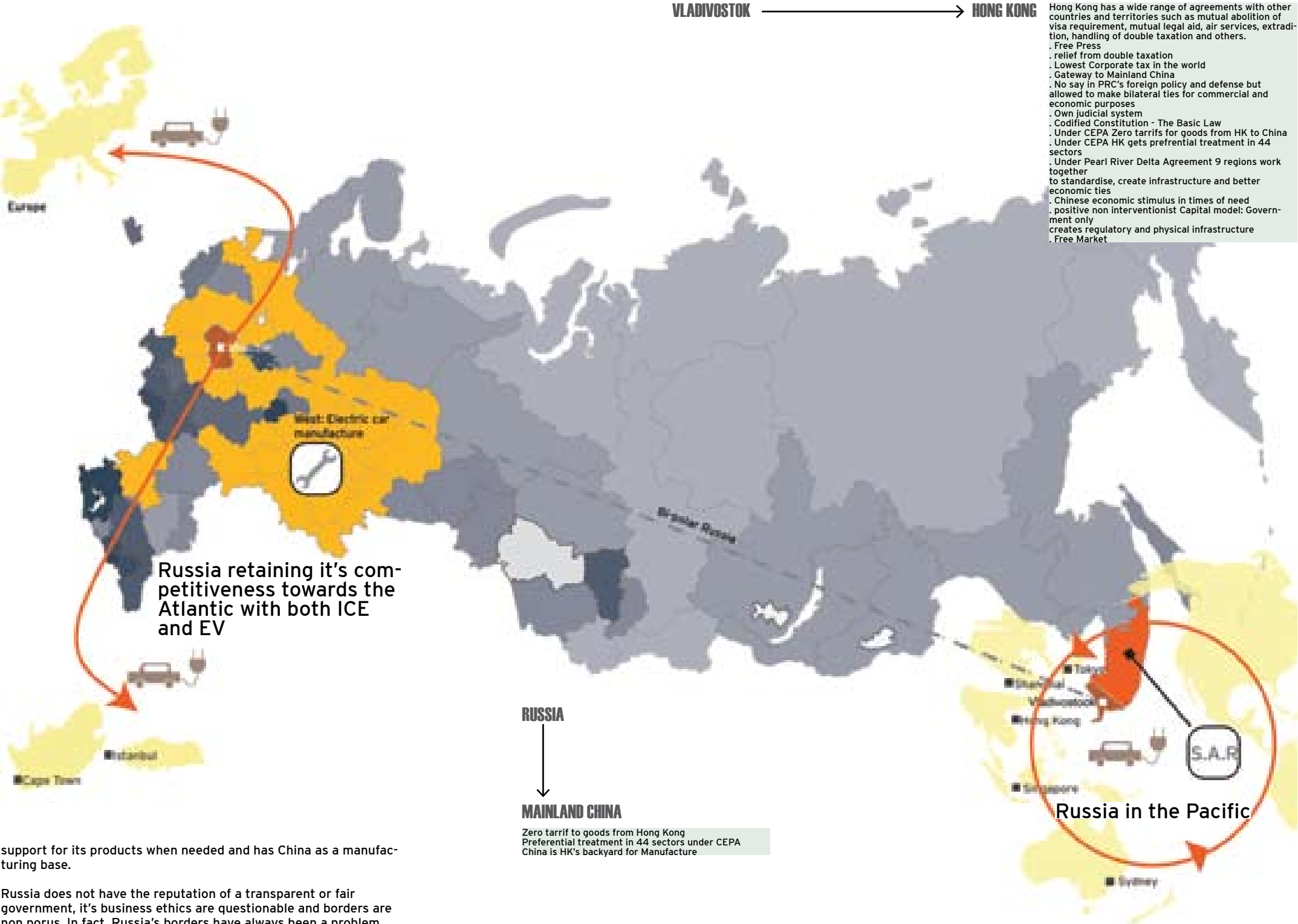
The region shows a well developed machinery and tool engineering industry, locomotive repair plants and radio electronic and automatic equipment manufacturing. Small and medium eterprises within the automobile component industry are available within the region.

Russia, is currently developing the region for the APEC 2012 summit,

By giving the Primorye region the status of a special administrative region,Russia can create a global cluster with Pacific countries that are currently active in the development of EV technology.

China, has two secial administrative zones, Hong Kong and Macau. By retaining the ‘one country two systems’ relationship, these two regions have maintained their eco-nomic growth and diversity, while the mainland is centrally controlled.

The benefits of the relationship is obvious for both China and Hongkong. It is a temporary solution that could be continued. The relationship is primarily for economic and trade benefits and the independence in these matters allows for decisions to be taken faster. The rule of law and independent visa regulations makes these regions safe and accessible, while at the same time Hong Kong has China's



support for its products when needed and has China as a manufac-turing base.

Russia does not have the reputation of a transparent or fair government, it's business ethics are questionable and borders are non porus. In fact, Russia's borders have always been a problem for it's own history and industrialisation. Many early attempts to jump start the automobile industry and make it competitive were thwarted by problems created by the import of machinery or the migration of knowledge into the country. As a special administrative region, Primorye will be able to distance itself from the centralised system of government and resurrect itself as a part of the Pacific economic association zone.

Phase C 2015 MOSCOW, ST.PETERSBURG, SAMARA, 2018: VLADIVOSTOK

Russia will adopt a fuel efficient vehicles because of carbon pricing (pricing on emissions, and export from high emitting countries) and due to increasing domestic consumption (causing it to start importing oil and gas).

The only question is if Russia will decide to do this slowly with strategic planning or if it will be forced to move suddenly with make shift solutions on demand.

In order to introduce Electric Vehicles in the country Russia will have to initiate legislation at a National and Regional level, and create systems so that private investment, small community and individual business opportunities are created.

national legislation

The battery pack in an electric vehicle is a fuel component and can be detached from the vehicle in sales and services. Once it was understood that batteries like gasoline, need to be readily available, interchangeable and refillable (chargeable in this case) the electric vehicle service industry began.

Across the world there are strategic collaborations between the EV industry and battery manufacturers and service providers.

It is not surprising that Renault-Nissan feature again in this example and that Renault Nissan are active in Russia and hold a share in the most prestigious national automobile brand in Russia.

Renault-Nissan has collaborated with Better Place, a global provider of EV networks and services. The company has introduced country specific solutions to promote electric vehicles. As I write this they have collaborations and solutions for Denmark, China, Japan, Australia, Israel, North America and the EU.

The electric vehicle should be marketed like a mobile phone. The consumer buys or leases the hardware (the car) and the battery and network is provided by the service provider. At the moment, the automobile company collaborates with service providers but over time the consumer will have a choice of the service providers making it very competitive.

As part of the National EV framework in Russia, the first step is to extend these existing collaborations , initiate cities and partnerships. Those already exist around the world and can be easily imported into the country. Renault-Nissan and Better Place is one such collaboration. Renault

produces cars in Moscow, so poetically, Moscow can be the first centre for EV just as AMO_ZIL was the first automobile manufacturer in Russia, located in Moscow in 1916. To ensure mass adoption National legislation has to create incentives and commit to changing government fleets (taxi, postal, police) over to electric vehicles. This will provide a guarantee for private companies to enter the market and for consumers to experience and trust the technology.

Global incentives include tax rebates, cash rebates, parking and charging preference, congestion charge redemption etc.

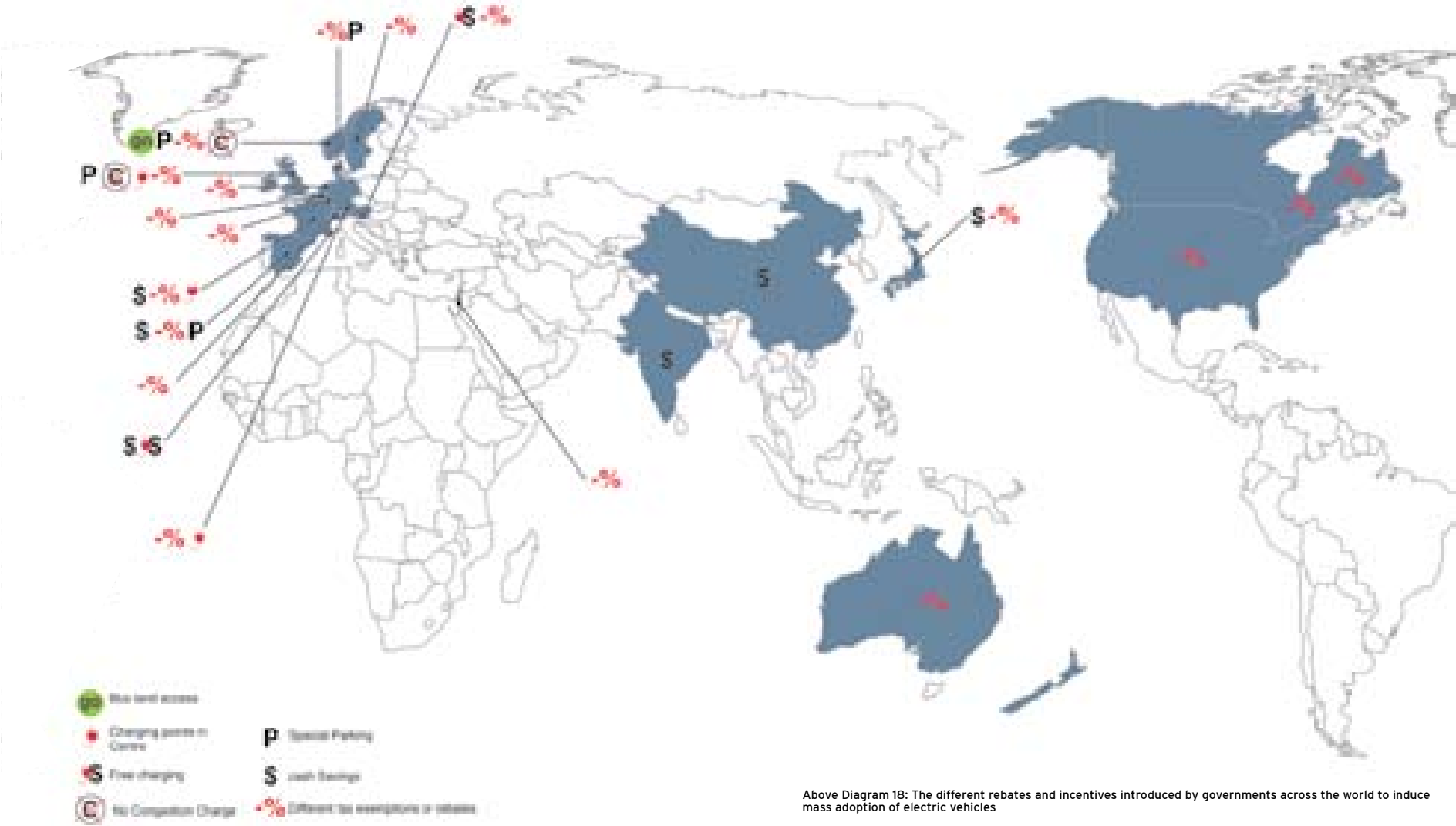
regional legislation

Along with National legislation aimed at making the car affordable

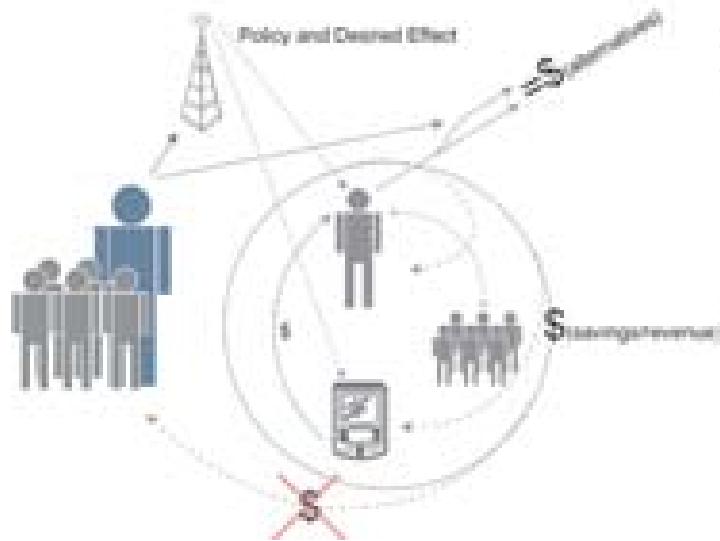
the government needs to draft a legislation that makes the use of any motorised vehicle a conscious and thoughtful action

The government should create multiple options for getting around the city, so that private car ownership is not the only alternative

The Government, Private investors and individuals should collaborate to change road transport choice and use through legislation, incentives, rebates and zoning and engaging the public (Transport Policy UK: Low carbon economy). The money flowing through the system should never be used as revenue by the state because it is counter productive to change. The government should provide constant dissemination of information to ensure that there is a general understanding of the policy and its desired effect.



Above Diagram 18: The different rebates and incentives introduced by governments across the world to induce mass adoption of electric vehicles



Left Diagram 19: The continuous monetary loop between incentives, rebates and fines. The money generated by the system should not be used for profits as it is counter productive

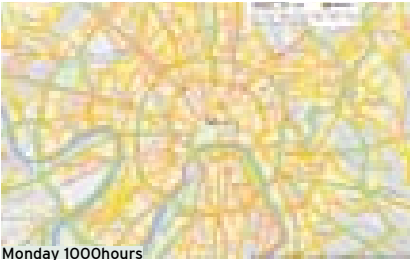
The rebound effect. It is very important to create a system where there is a strong relationship between energy consumed and action of the individual. Unfortunately, monetising the relationship seems to be the way.

private investments

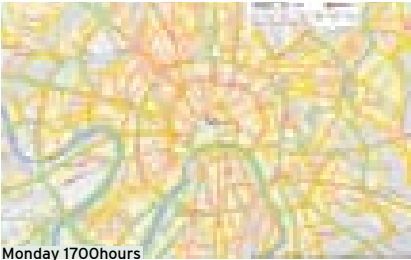
Private investment is the bridge between the government and the small enterprise. Private investment collaborates with the Government to create infrastructure, disperse incentives in form of bonus, loyalty points and services. They also create a system that small enterprises find a platform to provide diverse and customised solutions and services.



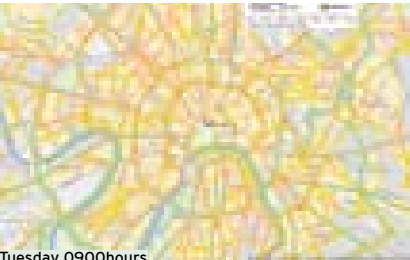
Monday 0800hours



Monday 1000hours



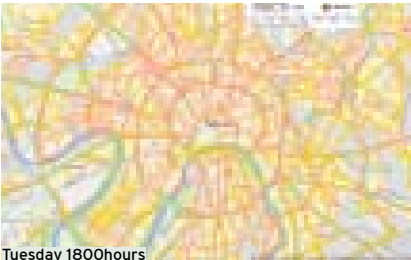
Monday 1700hours



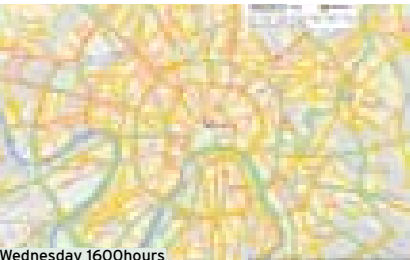
Tuesday 0900hours



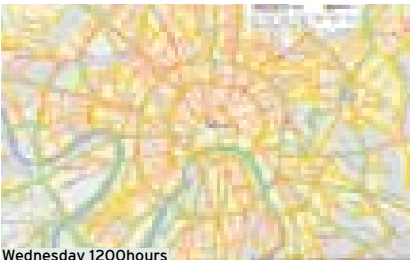
Tuesday 1100hours



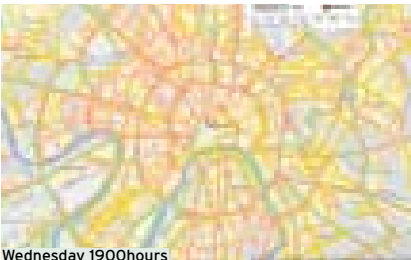
Tuesday 1800hours



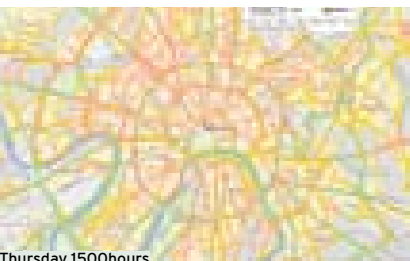
Wednesday 1600hours



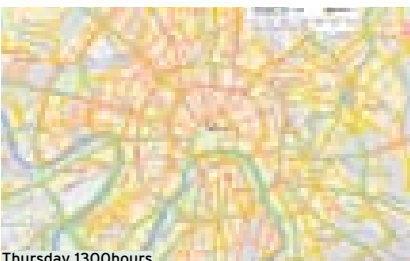
Wednesday 1200hours



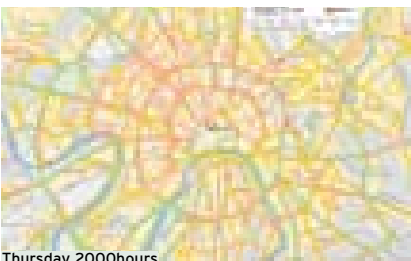
Wednesday 1900hours



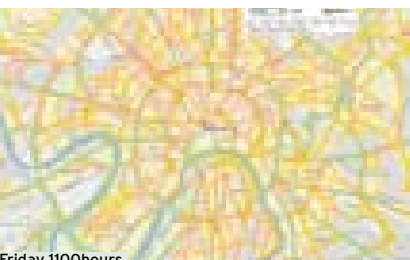
Thursday 1500hours



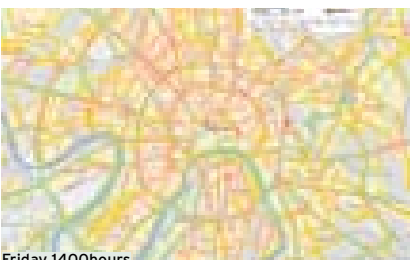
Thursday 1300hours



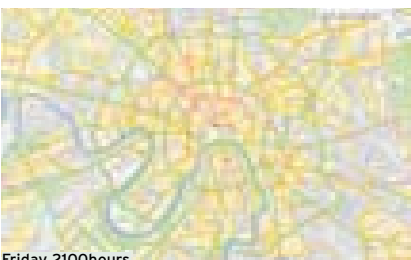
Thursday 2000hours



Friday 1100hours



Friday 1400hours



Friday 2100hours



Saturday 1200hours

From Communism to Congestion

By BORIS LICHURIN
Published September 11, 1997

A decade ago, even the sight of a plain-looking Lada 16 was rare on the streets, since buying a car was not only expensive but often required a long wait. Now, the tiny Ladas snake around packs of hulking, aggressively driven Mercedes and BMW sedans. Both driving and walking have become hazardous during rush hour, which now lasts much of the day in central Moscow. And because sidewalks are often as wide as a traffic lane, drivers use them as shortcuts, looking at pedestrians to clear a path.

“Something like communism- in the good sense of the word... It’s a wiki” At first, drivers had sent information by phone or text. As more and more drivers started using G.P.S. enabled smartphones, Yandex asked them to download Yandex software onto their devices, so that information about their movements could be sent automatically to the Yandex servers

-Letter from Moscow, New Yorker August 2010

“But let us return for a moment to the hard-pressed Zaporozhets-driving engineer. Did he just happen to encounter a pedestrian late at night and generously offer him a ride? Or was he actually cruising for passengers, that is (I hasten to add), using his car as a taxi? If the latter, he would have crossed the line dividing “personal” from “private” property, for, as an article in Izvestiia explained, personal property was “that which is destined exclusively for the personal needs of the owner or his family” – like refrigerators and vacuum cleaners. It “cannot be used for profit, enrichment, or earnings”

cars for comrades By Lewis Siegelbaum

“one of the distinguishing features of cars in the Soviet context was that they had greater “knock-on effects” than any other durable good. Road transport, according to the economist Peter Wiles, figured among the activities “most affected” by second-economy activities”

“Cars, Cars, and More Cars: The Faustian Bargain of the Brezhnev Era” Lewis Siegelbaum

The succesful deployment of the electric vehicle is dependent on multiple actors adopting the device and creating innovative customised solutions for it. This creates the wave of a clean technology economic innovation.

The next few pages scenarios how new technology prompted by legislation and private investment will generate behaviour change and decentralised economic activity.

Explanation of the index:

*The Informal 'catch a car taxi' : The taxi drivers come into the informal employment sector and are usually people who own a car and who are looking for additional income by offering rides in the same direction or groups of people who have created a source of income for themselves as unsigned taxi drivers or pensioners looking for additional income

*Tax rebates for consumers to buy an electric car OR direct cash rebates depending on regional policy (Refer to diagram on incentives for consumers)

*Low emission zone: Zones within which only non polluting vehicles are allowed in freely. There is a daily charge for any vehicle that does not come within the definition of a non polluting vehicle <<UK>>

* Road Tax: As gasoline is replaced with electric vehicles the amount of money that was to collected within the selling price for gasoline as road tax will be changed to a direct road tax that will be collected on the amount a vehicle is driven (kilometers per year). This is a forecast that is mentioned by Robin Chase.

* Parking Charge: All residential, offices and commercial establishments will be charged for parking that is not for electric vehicles. This can be enforced by smart parking spaces. <<Proposed>>

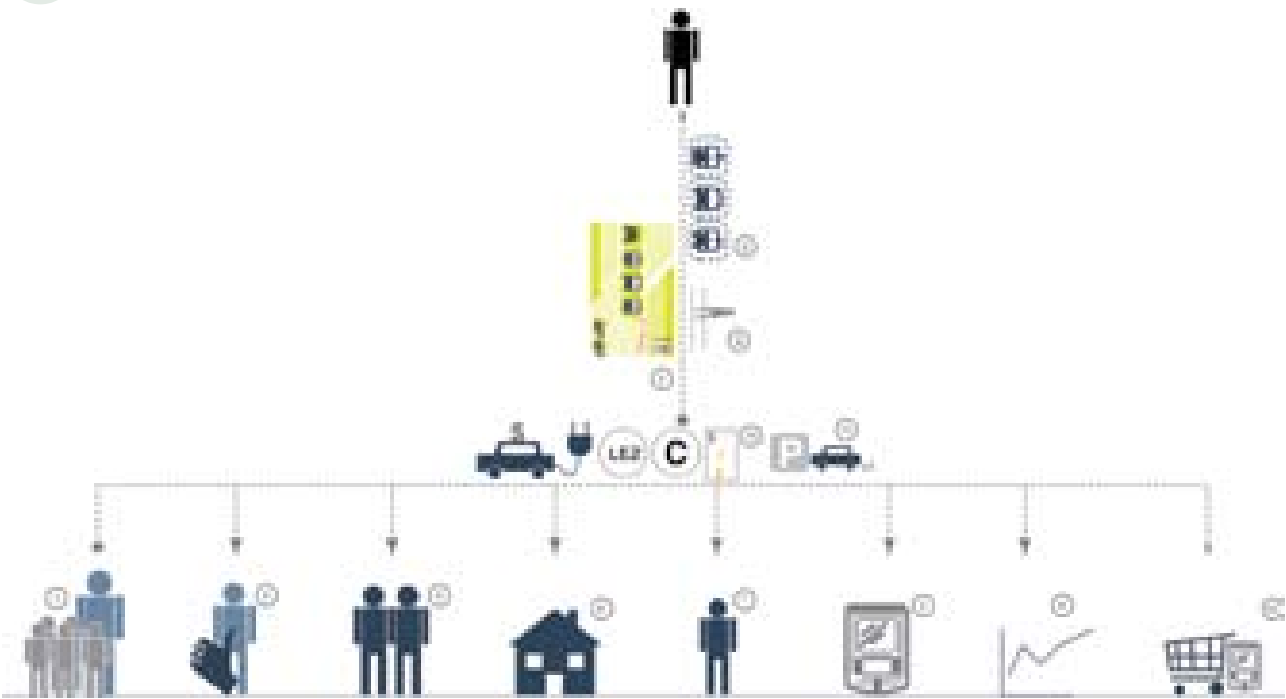
* Corporate Emission Tax: Corporates will be charged a fee on their fleet, In addition there will be incentives that allow for the corporates to create electric car parking and charging and offer travel package incentives to employees <<Proposed as suggested in the low carbon transport policy for the UK>>

*On Surface crossing: this would make it less tiring for older people to cross the road. It will increase the number of traffic lights and waiting time for cars: Russian cities move towards pedestrianisation. In the summer this would allow for bicycles to be used with ease. <<Proposed>>

* The Network: to provide all the solutions, integrate them and create a cohesive functioning unit. <<Robin Chase>>

<<The scenarios are created by Understanding the Low carbon transport Policy for the UK, talks by Robin Chase and have been modified and adapted to Russia. Where there has been a direct use of a policy initiated by another country it is mentioned>>

1



Above: Tax and rebates offered by the government with solutions provided. The strategy is 'Inconvenience with Alternatives'

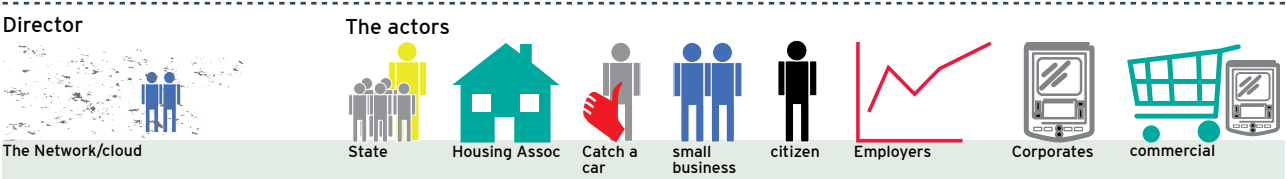
Step 01: The stage is set and all motivators are introduced simultaneously. They affect all the actors monetarily and prompt them to discover or introduce new solutions.

Step 02: With the right private investments and information dissemination: innovative solutions and secondary economies are created.

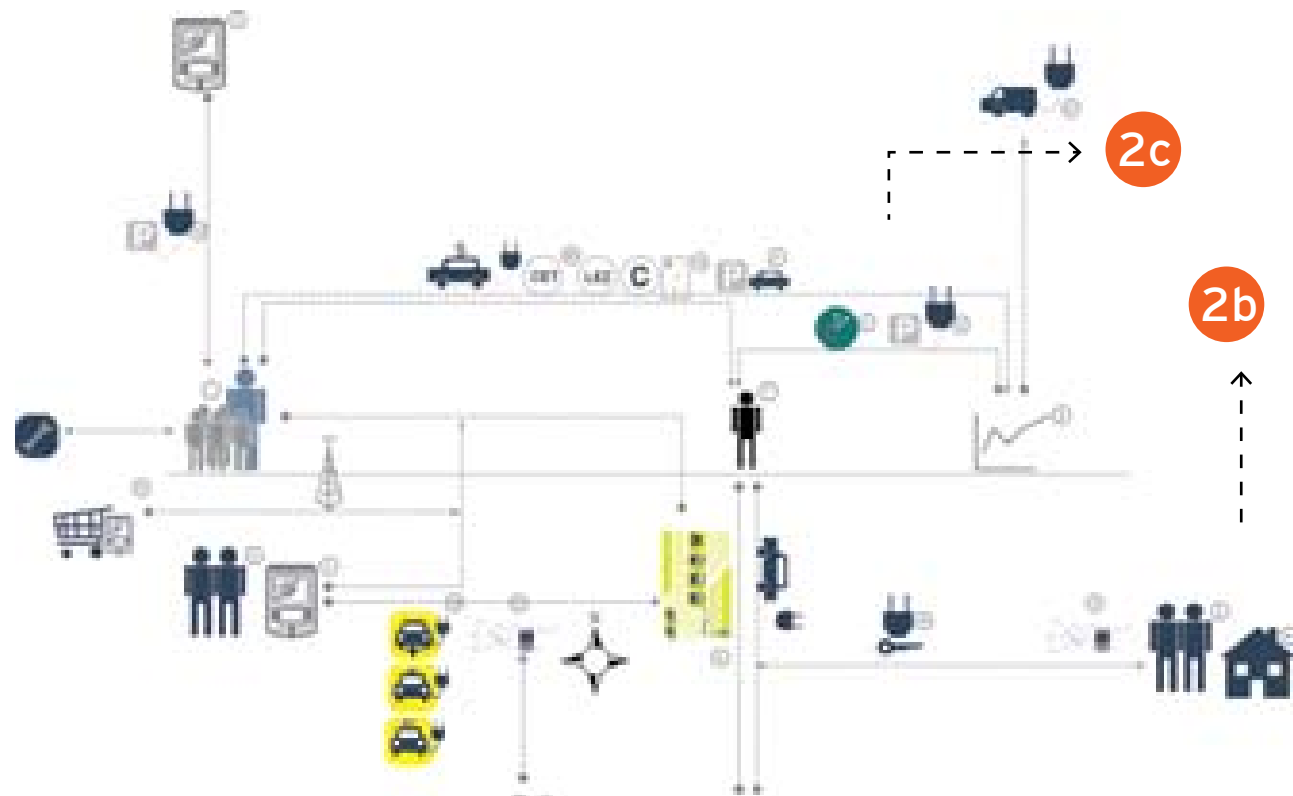
Rather than being sanctimonious about the use of private transport by suggesting behaviour change will save the world or act as a tool for community building we will introduce the idea as simply one that makes economic sense to individuals . This makes sense not only as a means of personal savings, but as a system that encourages entrepreneurship, small scale individual business and reinforces the idea that the private car is a tool for independent business and innovation.

This is not new in Russia. The automobile throughout Russian Soviet history has been a mode to generate income, we can see this even today in Moscow and St. Petersburg where every car is a potential taxi.

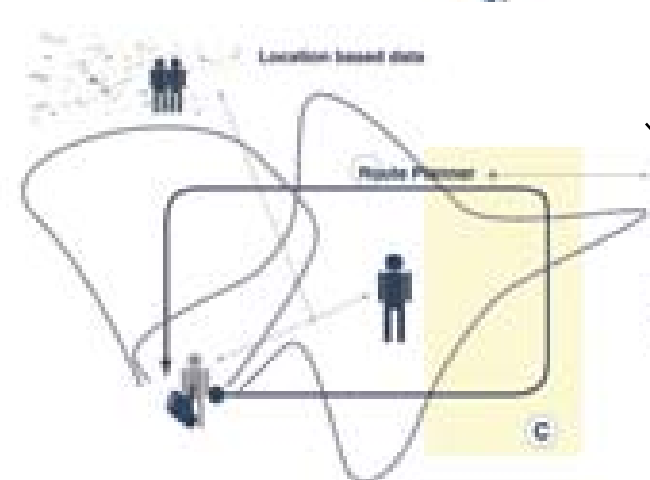
On the right we see the system being activated and the various props being created. Step 2 bifurcates into a variety of solutions and opportunities (a,b,c ...)



2 Innovation Economy: small/medium scale



Above: Mapping the potentials generated on introduction of EV in the country with tax and urban planning solutions to pre-empt the rebound effect.



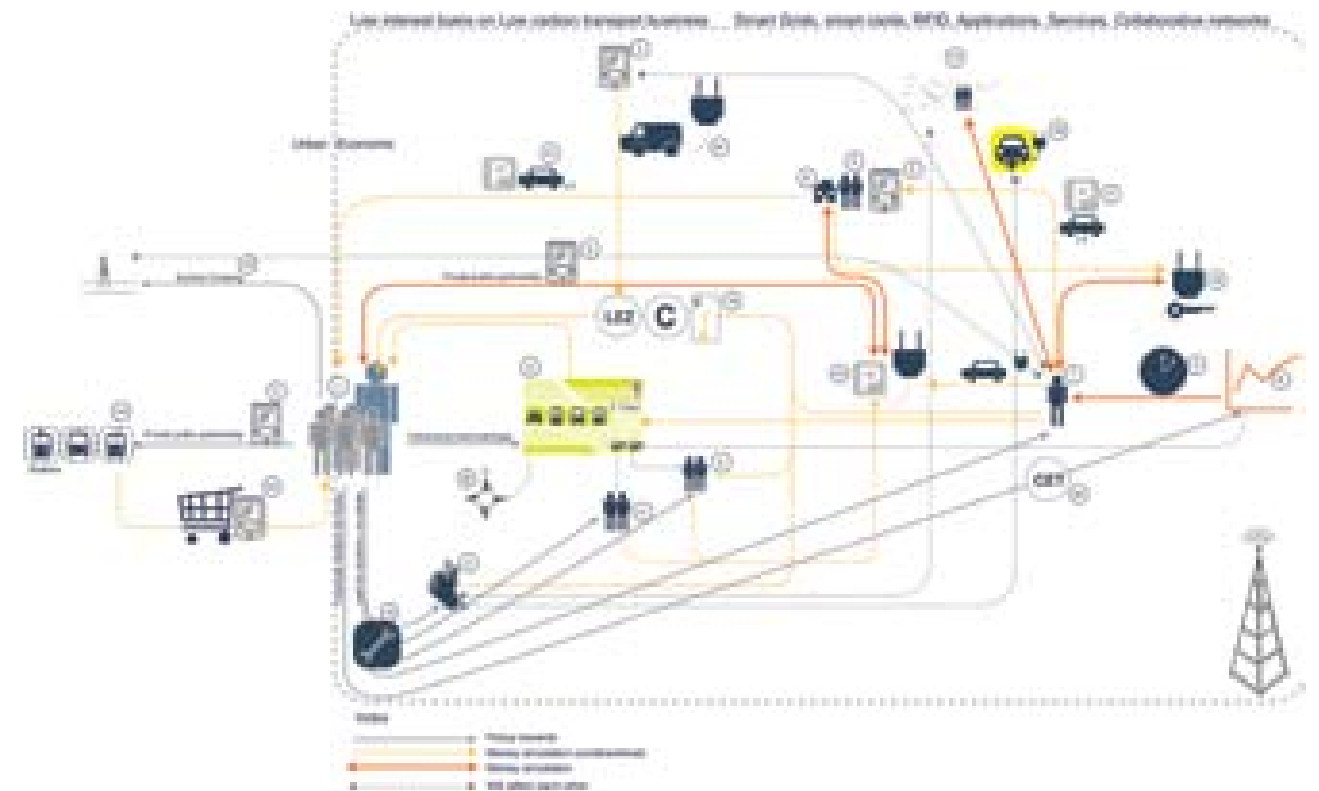
2a

Step 2a: The ease with which one can flag down a car is unique to Russia. This makes it less desirable to own a car, frees taxi companies from monopoly ownership, and makes ride sharing a reality in Russia.

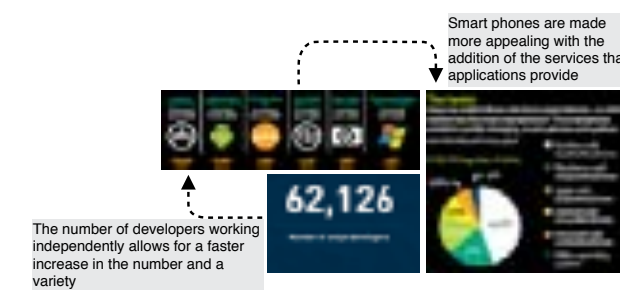
Find customers without wasting resource
Ensure that he has a reasonable earning after deduction of road tax and congestion tax

Road tax = Km driven per day and Km driven annually
EV tax rebate = Electric Km x 2
Earnings per day = Customer charge - (Road tax + EV tax)

Left: The route planner to engage the informal taxi into the innovative economy as they provide a solution to excessive car usage.



The process entails the creation of a decentralised service, developer and infrastructure networks. As more people become part of the business of electric vehicle initiatives and driving less, there would be greater incentive for the electric business initiative to expand. The business is modeled on the apple application network, in which a multi developer platform provides a diversity of custom services to meet the demand of the consumer.



Critique



Congestion charge



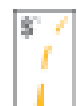
Low emission zone



Corporate emission tax



EV rebate

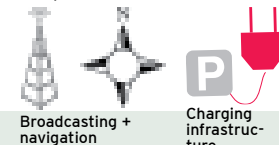


Road tax



Parking

Props



Broadcasting + navigation



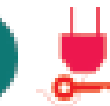
Charging infrastructure



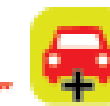
Delivery services



Corporate travel credit



rent-charging



share a ride



taxi



rent a car

Stage sets



surface crossing



surface mass transport weathered stations

summer-winter urban transformations



The striking contrast between Summer and winter is apparent in the urban fabric of the city and it asks for two transportation models to be developed.

As observed in Russia, Summer is extroverted and celebrated with dramatic vigour in a complete contradiction to the introverted passive winter. Porches, terraces and plug in solutions are constructed especially for the summer and these would be a nuisance and hindrance when there is the weight and dampness of ice.

The proposal introduces a relationship with personal transport that is based on temporality and non ownership. This attitude comes from a change similar to views in fashion, trends and personalisation. It will be a rental model.

The city will morph in the Summer to enhance this transformation dividing roads into lanes for bicycles, and pedestrians, while confining cars to a smaller area. This is feasible due to the large width of its roads.

2b Micro transport solutions for the housing districts



The Electric-gas hybrid auto rickshaw: India



The concept solar-manual autorickshaw : London

Three wheeler autorickshaws are used in India as a taxi in the small cities or in localities in the city (North Bombay). At the moment electric-hybrid autorickshaws are being developed though the autorickshaws in India use CNG and LPG as fuel.

The distances within rayons is daunting for senior citizens and children in the winter. This is a reason to own a car. An alternative mode of transport that acts as a shuttle for between one and three people within the rayon, to and from the metro could be a developed weather proofed electric autorickshaw. The rickshaws will create informal employment for pensioners of the community.

Just like freight transport solutions that is going to be described in the following page, the problem of transport lies in multiple solutions for different distances and needs.

X Solution X: Multi- user integrated travel package <<proposed in the UK>>



The Metro in Russian cities is well developed. With the aggressive promotion of the automobile industry, it has not been maintained or modernised to cater to current traffic.

The existing metro travel card is charged on the number of trips, and is independent of the user and the distance of travel. This allows the Metro to be cheaper and transaction time is less especially for co-passengers who are infrequent metro users.

The integrated travel card, includes surface transport within the metro charge if it is used within the hour and it provides bonus points to use rental cars and taxis.

Transport seasons

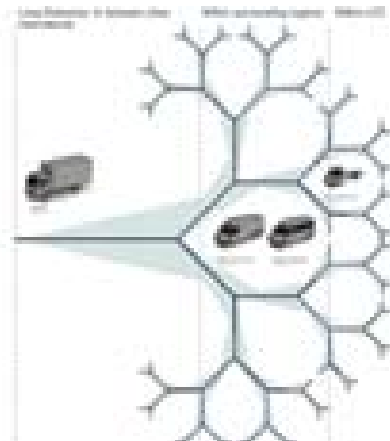


2c low emission zone and corporate emission tax and change in freight

62% of the Russian Trucks and Light delivery fleet is over 10 years old. Russia has about 5.3 million vehicles <<Environmental performance of motor vehicles and fuels in the Russian Federation Prof Vadim Donchenko (NIIAT)>>. A truck in Russia consumes about 3 liters of petrol per kilometer. Low transportation costs have benefitted business by allowing them to locate warehouses and create just in time delivery models remnant of the Japanese lean production technique, <<Low carbon transport policy for the UK>> transferring their saving to environmental costs for the country. By implementing a corporate emission tax and a low emission zone (UK) this environmental cost is reverted back to private corporations and will result in a shift to electric delivery vehicles along with a more diverse network and strategic planning of delivery.

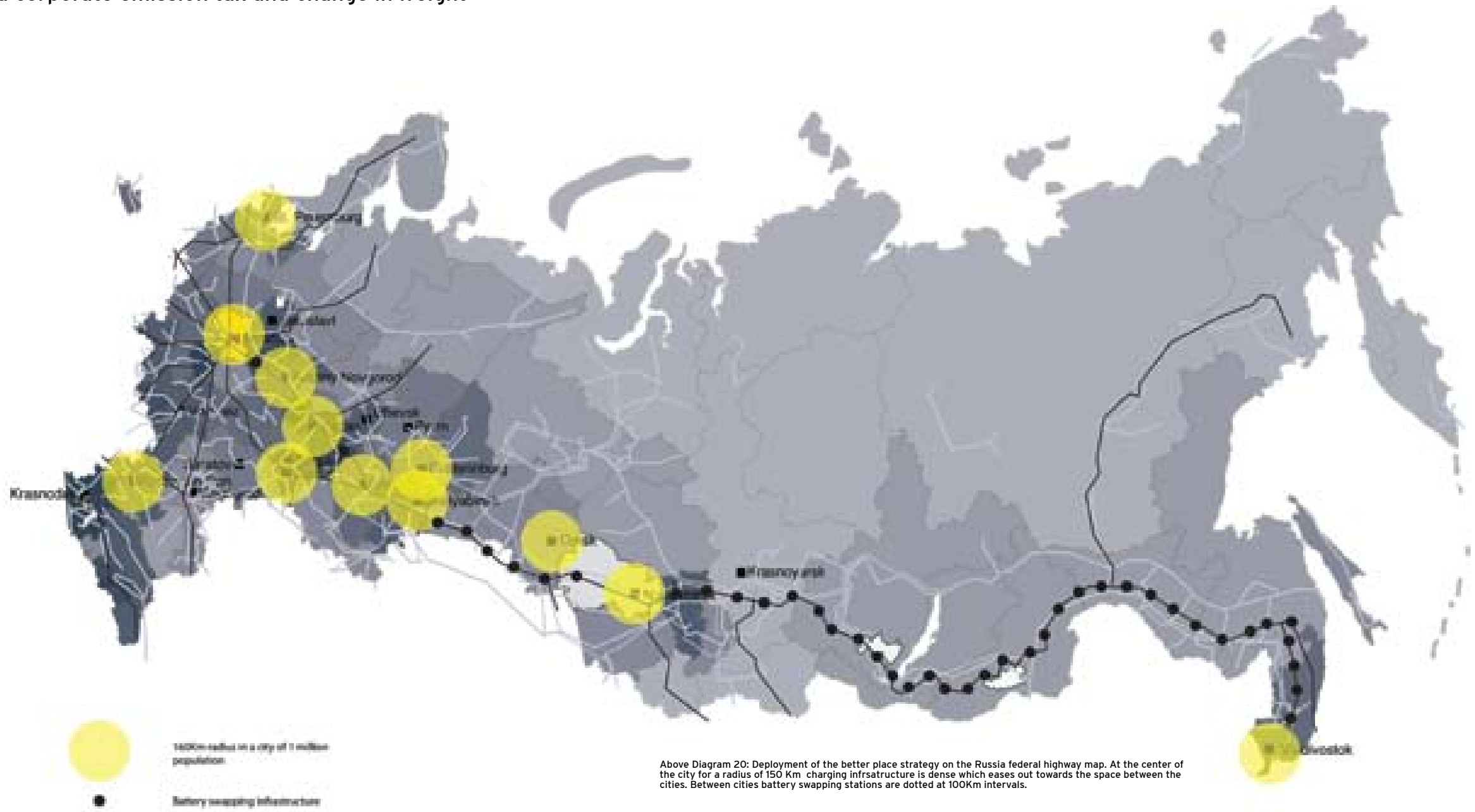
Russia's main federal highways overlap with the electricity grid. With Battery swapping stations and overnight recharging facilities it would be possible to increase the freight range across the landscape of Russia. Strategic redistribution of warehouses and gradation of the fleet is important to prevent unnecessary battery drainage which is inevitable if a single size heavy freight is used for all needs.

The Better Place deployment strategy for California makes intuitive sense for for Russia as the distance between the dense city circles is a maximum of one battery swapping station. Charging infrastructure is deployed in a reducing frequency starting at the centre towards the periphery. The Federal highway between the 11 main cities are dotted with battery swapping centres every 100Km (the basic guideline is that an electric vehicle has a range of 150KM on full charge and a PHEV has a range of 40Km before it runs on fuel).



Right: As transport cost is lower than land cost it is usual for companies to have one centralised warehouse that holds the stocks in the periphery of the city. Goods are transported across the city in larger vehicles as they service many distribution centres.

Warehousing and supply chains has to be redesigned to create a branching urban system where location of the warehouse and size of freight are graded to reduce the distance heavy load is trucked across the landscape.



Above Diagram 20: Deployment of the better place strategy on the Russia federal highway map. At the center of the city for a radius of 150 Km charging infrastructure is dense which eases out towards the space between the cities. Between cities battery swapping stations are dotted at 100Km intervals.

"As we can see from the results of this research, the use of electric cars and other eco-friendly vehicles will spread more slowly in emerging economies than in developed ones; Russia is falling behind significantly in this regard," said Yuriy Zaremek, Director Partner, Head of the CD Automotive Practice. "For example, the existing infrastructure needs to be completely redesigned in order to promote electric cars, which might take a long time. Without serious federal support and political drive, electric cars will be unable to gain a foothold and become widespread in Russia."

Mitsubishi i-MiEV headed to Russia

by Mitsubishi Motors

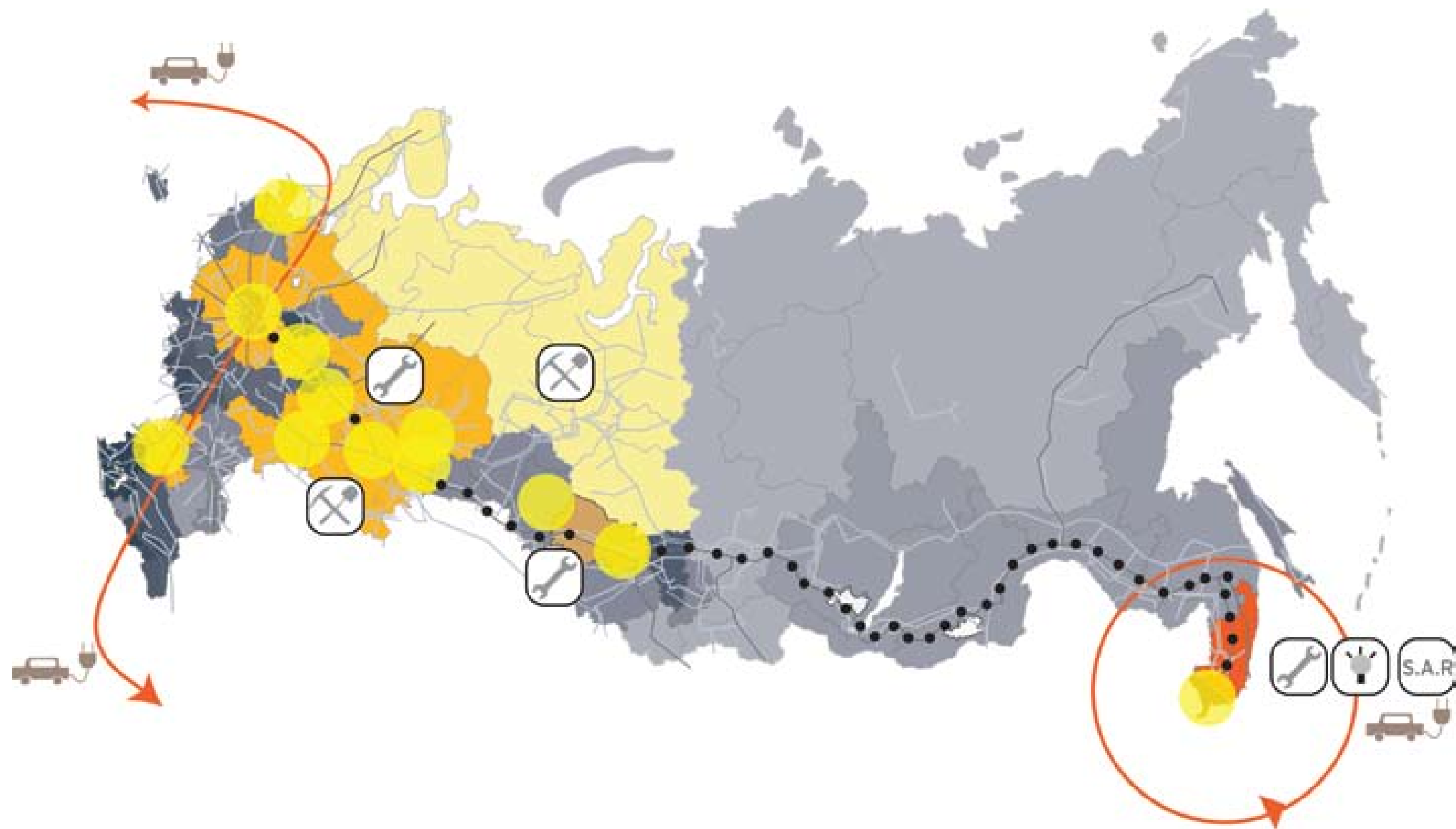
2011 “Car owner is the one social category that has actually been created in the past twenty years, as opposed to all the social categories that have been destroyed. Perhaps this is the emergence, finally, of a propertied, stakeholding - and frustrated, selfish, neurotic - middle class “

—Letter from Moscow, New Yorker August 2010

2018 An attitude to personal transport that is based on transformation and non ownership.

An electric vehicle is marketed like a mobile phone. The consumer buys/ leases the hardware (that is the car) and the battery and network is provided by the service provider.

ELECTRIFIED!



Elect.Yo mobile

With the offering competition of the electric vehicle in Russia, the Yozmobi is redefining its ambitions

By Stewart Little June 2014



Nationally
Competitive

Batteries Recharge Novosibirsk

Employment in Novosibirsk, Western Siberia increases with European investments for new battery production plants

By Stewart Little June 2014



Resources used
to create internal
knowledge

Primorye overlord the EV industry

The old Soviet Novol base resurrected as the centre of the Electric vehicle industry shakes China's ambition

By Stewart Little April 2014



Globally com-
petitive

ELECTRIFIED!
will create a
Russia that is
economically
competitive in the
global economy

FURTHER READING

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Diagram 13: Deloitte publication: Driving e-mobility; economic stimulus and other support spur development for alternative vehicles
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SPECIAL THANKS

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